DOCUMENT RESUME

ED 119 476 [illegible] 419

AUTHOR Scollon, Ronald
TITLE One Child's Language from [illegible] rigins of Construction. Working Pap[illegible] s, Vol. 6, No. 5, July-September 1974
INSTITUTION Hawaii Univ., Honolulu. Dept. [illegible] cs.
PUB DATE May 74
NOTE 310p.; Ph.D. Dissertation, Uni[illegible] Hawaii
AVAILABLE FROM University Press of Hawaii, Ho[illegible] awaii 96822 (revised version)

EDRS PRICE MF-$0.83 HC-$16.73 Plus Postage
DESCRIPTORS *Child Language; Discourse Analysis; Interaction; *Language Development; Language Patterns; Language Research; Language Usage; Oral Communication; *Psycholinguistics; Research Methodology; *Semantics; Sentence Structure; *Syntax

ABSTRACT

In speaking a child sometimes makes constructions in which a sequence of separate utterances expresses a semantic relation not expressed by either utterance. These "vertical constructions" are the main point of this study. Previous studies of construction in child language have largely dealt with sentences. In this study, sentences are called "horizontal constructions" to distinguish them from vertical constructions and to point up the constructional nature of senquences which are not sentences but, rather, discourses, i.e., vertical constructions. The importance of vertical construction is demonstrated on the grounds that these constructions are the developmental basis for horizontal constructions. Once horizontal constructions are developed, vertical construction continues as an active process, resulting in more complex constructions. The second point of this study is methodological. Despite the importance of vertical construction in the development of language, investigators have not discussed this phenomenon because their research has been limited to the study of phonology or sentences. This study, by including one-word utterances, repetitions, unintelligible utterances and discourses, points out the developmental continuity from early conversation to later sentences and proposes that language is learned, primarily in the communicative interactions between the child and other speakers in the speech community. (Author/CLK)

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ONE CHILD'S LANGUAGE FROM ONE TO TWO:
THE ORIGINS OF CONSTRUCTION

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN LINGUISTICS

MAY 1974

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EDUCATION & WELFARE
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- Brenda Wong -

ABSTRACT

In speaking a child sometimes makes constructions in which a sequence of separate utterances expresses a semantic relation not expressed by either utterance. I have called constructions of this type "vertical constructions" and they are the main point of this study. Previous studies of construction in child language have largely dealt with sentences. In this study I have called sentences "horizontal constructions" to distinguish them from vertical constructions and to point up the constructional nature of sequences which are not sentences but, rather, discourses, i.e. vertical constructions. I argue for the importance of vertical construction on the grounds that these constructions are the developmental basis for horizontal constructions. In addition, once horizontal constructions are developed vertical construction continues as an active process, resulting in more complex constructions.

The second point of this study is methodological. In spite of the importance of vertical construction in the development of language, investigators have not discussed this phenomenon because their research has been limited to the study of phonology or sentences. This study, by including one-word utterances, repetitions, unintelligible utterances and discourses is able to point out the developmental continuity from early conversation to later sentences and proposes that language is learned primarily in the communicative interactions between the child and other speakers in the speech community.

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SECTION I

Organization

It was once the style to address "the gentle reader" with an ambulatory preface in which everything but the central point of the essay was mentioned. In these days and in this case I feel it is more appropriate to address the harried reader and get on with my business. My intent here is to offer a brief guide to the remainder of this presentation. This first section begins with an introduction of the study. This is followed by Chapter II on the organization of the data which are the foundation of this study. Section II consists of four chapters in which the areas of phonology (III), intonation (IV), discourse redundancies (imitation and repetition - V), and discourse (VI) are treated in turn. It (or Section II) constitutes the background from which the study of construction emerges. Section III, then, discusses construction. Section IV is a review of the literature and a discussion of my method. Section V contains the appendices. Appendix A includes the Tables and Appendix B is the bibliography.

CHAPTER I

Introduction

I.1 Vertical Construction

At age one year, seven months and two days the little girl in this study picked up her mother's shoe, held it right before her eyes and while she stared at it said, [mama.mama.mama.mam.š.ši.šiš.šu.šuˀ.šuš].[1] I think that what she said is understandable as 'mama's shoe'. I think that it was intentional, and that the utterance expresses a semantic relation that is not expressed by either word. This relation is expressed by means of a construction. I have called constructions of this type "vertical constructions" and they are the main point of this study.

Studies of child language have dealt with sentences. In this study I have called sentences "horizontal constructions" to distinguish them from vertical constructions. The difference between them, in a few words, is that horizontal constructions (sentences) express constructional relations under a single utterance intonation contour. In vertical constructions the utterance contour is applied to each part of the construction.

I argue for the importance of vertical construction on the grounds that these constructions are the developmental basis for horizontal constructions. In addition, once horizontal constructions are developed vertical construction continues as an active process, resulting in more complex constructions.

---

[1] Table 1 explains the symbols used. Tables are located in Appendix A, Section V, beginning with p. 247.

In making my argument for vertical constructions I point out that they develop for the child in interaction with other speakers on the one hand and repetition of the child's own utterances on the other. I further argue that this mechanism of interaction and repetition is not specific to syntactic development but is general to language development. I suggest that this process follows on earlier nonlinguistic sensorimotor developments.

I.2 Vertical Construction and Linguistic Method

The question then arises; If vertical construction is such an important process of language acquisition why have other investigators not been concerned with it? The answer has to do with the method of research. In some cases the focus on a specific aspect of development such as the sentence or phonology has prevented investigators from seeing the relations between these separate aspects. In most cases a focus which has been too narrow has explicitly excluded from study three types of data on which this study is crucially founded--one word utterances, repetitions, and unintelligible utterances. Since the first vertical constructions are sequences of single-word utterances the exclusion of these from study effectively eliminates vertical constructions from consideration. In the study of the development of repetition I found that I could show that vertical construction progresses from initially highly tentative constructions that are largely dependent on interaction with other speakers to constructions in which the child shows a large measure of control and independence. Finally, the inclusion of unintelligible utterances was important because many of these could be understood by an increased use of the context of the situation and my own developing knowledge of the child's system. I found that some of these unintelligible utterances were, in fact, unintelligible because of their presence in constructions.

This methodological issue is the secondary point of this study. By narrowing the focus to some specific aspect of language acquisition before undertaking the study, other investigators have effectively excluded the data that are needed to understand vertical construction and, ultimately, horizontal construction as well. In this study I have taken a broader focus and in doing so have found that horizontal constructions (sentences) are a later development which is begun in vertical construction. I argue that this developmental process can only be seen when a focus broader than the sentence is taken.

I.3 Organization of this Study

This presentation is organized with nine chapters divided into four sections, plus a fifth section of appendices and bibliography. The first section deals with the organization of the study. This first chapter introduces the presentation. The second chapter describes in detail how the primary data of this study were collected and studied. In the interest of comparability I have given considerable detail. One of the difficulties in dealing with studies of child language is that many of them simply cannot be compared with other studies because of a lack of information about the data. Chapter two is intended to make the data of this study as fully comparable as possible. In general I have followed Brown (1973) in details of notation. I have specifically tried to make clear what data have been included or excluded at the level of recording, transcription, analysis and finally at the level of presentation.

The second section consists of four chapters in which I present everything but construction. Chapter three discusses phonology from a quite early stage up to the beginning of horizontal (sentence) construction. In the study of phonology some questions are first raised. For example I have discussed (1) the treatment of repetition, (2) my understanding of imitation, (3) the means of arriving at glosses for the child's utterances, and (4) the interaction of phonology and construction.

Chapter four is a study of the development of intonation. Sentences have been defined in the literature by reference to primary stress and terminal intonation contour. In this study I show that this intonation contour develops during the early one-word period and that it continues to interact with subsequent phonological developments until it reaches a condition of relative stability just before the beginning of horizontal construction.

Chapter five deals with what I call discourse redundancies. These are imitation and repetition. Imitation repeats (is redundant in relation to) another speaker. Repetition repeats (is redundant in relation to) the same speaker--in this case the child. These two processes work to expand the child's system. Imitation provides models for advancement while repetition practices variation within the current system. Both processes first work in development of phonology and then later in the development of syntax.

Chapter six is about discourse itself. Very early in this study I noticed that the child 'talked' with other speakers. Discourse is the interactive space of the child's communication with the mature language. I found that vertical constructions develop out of these interactions. That is, the child's system develops in interactions with the adult system. On the other hand, the adult system undergoes quite striking changes in interactions with children. These changes are more extreme in the early stages and less extreme as the child develops. It appears that the adult extends his system as fully as possible at first to maximise the communication overlap and then gradually withdraws the extension and in the process leads the child toward the mature system.

Section three is directly about construction. Chapter seven discusses the constructions I have found from an external point of view. Vertical constructions are shown to exist in at least four types which are cross classified on the dimensions of repetitions and discourse. I show that vertical constructions with many repetitions precede in development vertical constructions with fewer and finally no repetitions of the elements in construction. At the same time the need for interaction with other speakers to produce constructions declines with time. These two developments converge on a type of vertical construction that is distinguishable from horizontal construction only by intonation pattern and the presence of a pause between the elements. I also show that these same four types are present in the following period of horizontal construction.

Chapter eight discusses the internal structure of horizontal constructions and vertical constructions. First I approach these constructions from the point of view of orderings of word classes. Then I consider constructions from the point of view of the expression of semantic relations.

Section four consists of one chapter, chapter nine, which is a review of the literature on child language. I look specifically for corroboration of my ideas about vertical construction. Since there is relatively little mention of such things in the literature I then take up the question of why this might be. The principal cause seems to be not that other children do not do it but that other investigators have excluded the data that would have pointed to vertical construction. Finally, I look at the method of this study. In particular, I bring up the use of context and intuitions in the collection and analysis of my data.

Section five includes the appendices and the bibliography.

It should be apparent that there is a considerable amount of restatement throughout this presentation. This is caused by the general problem of exegesis that in order to understand one of two points one must be familiar with the other one. Since it is not possible to place both points first I have adopted the means of rather frequent recapitulation. Since the main two points are about vertical construction and the methodology that led to this study of vertical construction, these had to be placed later in the presentation where they could be seen to be based on a foundation of the earlier discussions of phonology, intonation, and discourse. The reader would be able to get a reasonable understanding of my main points by reading only sections three and four. For support of any of the conclusions of those sections, however, the reader will need to refer to the earlier discussion in section two.

CHAPTER II

The Data

II.1 Elements of the Recording Sessions

This section will discuss the three main elements of the recording sessions; the subjects, the setting, and the recording equipment.

II.1.1 The Subjects

The primary subject of this study is Brenda Wong. I have not chosen a pseudonym for her for two reasons. Her first name appears so frequently in the data that the use of a pseudonym would introduce the problem of alteration of the raw data itself. This would be particularly problematic in the area of phonology. The second reason is that Brenda's last name, Wong, is found at a high enough frequency in Honolulu that her anonymity is effectively safeguarded.

At the beginning of this study Brenda was one year and two days old (1;0.2).[1] At the last session she was two years and twelve days old (2;0.12). Brenda is a normal, healthy child. When she was quite young her parents had her tested by an audiologist because they suspected some hearing deficiency. The audiologist also suspected a hearing deficiency but recommended waiting to watch her early speech development for confirmation. Brenda's development during the time of this study both in her speech and in general has allayed any fears her parents might have once had. Her talkativeness and willingness to participate, not to mention her sense of humor, have facilitated the study of her speech.

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[1] In the interest of comparability I am following the age notation of Brown (1973).

Brenda is the second child in her family. Her older sister, Charlotte, was four years and six days old (4;0.6) at the beginning of this study. Charlotte was present in all of the recording sessions except one and as a result is often very actively participating. I didn't try to exclude Charlotte from the recording but my focus on Brenda sometimes precipitated competition between the two sisters. On the whole Charlotte learned to take a secondary role during the time of the recordings and finally began to try to prompt Brenda's speech for show.

In the course of the year covered by this study Charlotte taught herself to read. Her parents have made no specific attempts to teach her but there is a general environment of reading in the home. As a result of the mother's reading to them and also probably of Charlotte's reading as well, Brenda has development much interest in books. These are the only two children in the home.

The parents of these children are in their early thirties. The father is Chinese, born in Hawaii. His speech is best called Hawaiian English or Creole. He has a college education and is a partner in an accounting firm. He was present only in three of the early recording sessions so his speech is not directly involved to any great extent as data. However, Brenda sees a lot of her father. Since the children play together with him for several hours each evening, he can certainly be considered an important influence in their development. Although the father was raised by parents who were bilingual in English and Chinese, his use of Chinese is quite limited.

The mother was born in Japan and moved to Hawaii with her family when she was about twelve. She went to college for several years but did not finish a degree. The mother speaks Japanese as her first language but also speaks Standard English in variation with what might be called Japanese Hawaiian English. She is not employed, and spends most of her time in the home with the children. The mother was present in all of the recording sessions and her speech in interaction with Brenda is an important part of this work.

My wife, Suzanne, and I were the two participant-observers in this study. I had originally thought that our participation would be minimal and that we would record mostly mother-child interactions. As the study progressed, however, my interactions with Brenda became more central and only Suzanne remained in the position of an observer. Our relationship with the family was established before the study. Brenda's father is Suzanne's uncle. Suzanne was born in Hawaii and first learned Hawaiian English and some Cantonese. Later she learned Standard English. Her speech now is best characterized as varying between Standard and Hawaiian English.

My own part in this study became quite central. As Brenda and I got to know each other our interactions became quite fluent. At the same time the other subjects tended to retire to the background whenever they knew that I was there for business. Without trying to do anything more than focus the microphone on Brenda for the time of the recording I apparently claimed more or less exclusive rights to her attention during the time of the recordings. For the first eighteen years of my life I spoke only Standard English (Midwestern). In some cases of imitation it is my speech being imitated. To what extent my speech has had any lasting effect on Brenda's development is hard to say. Her speech and apparently her mother's speech have had an effect on my speech at least during the recording sessions.[1]

Table 2 lists the recording sessions in considerable detail. The subjects above are abbreviated as follows: Brenda, B; Charlotte, Ch; Mother, M; Father, F; Ron, R; Suzanne, S. In one session (042)[2] a neighbor named Jill (eight years of age) was present. In one other session (151-152) many others were present. That tape has not been considered of central importance to this study. On the whole Brenda, Charlotte, the mother, Suzanne and I were the participants in all of the tapes.

II.1.2 The Setting

All of the recordings except two were made in Brenda's home in Honolulu. In the first several sessions, before she learned to walk, I recorded her mostly in the same place in the living room. When she started getting around and learned that I would follow, she began a game (of which she is still not tired) seeing how far and fast she can pull me along behind her. As a result the recordings have been taken in most parts of the house and outdoors in the yard.

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[1] See VI.6, p.138, on adult speech.

[2] See II.2.2.6, p. 22, for discussion of this notation.

The house has three bedrooms (each child has her own) and a large living room-dining area. There is also a large enclosed patio. It is furnished in a style common in Hawaii which mixes Japanese and Western elements. All footwear is left outside and inside there are both chairs for Western style seating and cushions for sitting on the floor. For these sessions we were rarely anywhere but on the floor when we were inside. Outside in the yard are a sandbox and a swing-slide set.

Since my wife and I are related to Brenda and her family we sometimes see them at times other than the scheduled sessions. This has afforded a chance to make an informal comparison of our interactions in different settings. Although the sessions recorded for study were quite regular in both place and the people present, they were not at all uncharacteristic. The main difference was in the continuous attention Brenda received during the recordings. Brenda normally gets a lot of attention but it is unlikely that she gets such predictably good attention from anyone else. It does not seem to have made any significant difference, however, as judged by her language use with other people in the family.

II.1.3 The Equipment

The tape recorder used was a Sony TC-110A with an F-26S microphone. At first it was used plugged in, but later as Brenda became more active a Sony BP-9 Battery Pack was used for electrical power. Suzanne used a small noteboook to make notes about the nonlinguistic context. This notebook often was used by Brenda for scribblings that she claimed were "nice". I made no attempt to conceal the tape recorder or the microphone but I tried to avoid drawing any particular attention to it. The surprising depth of such a young child's understanding was demonstrated one time when she was 1;3.4. (This tape was not included in the main body of data because of an unusually large number of interruptions.) I had set up the tape recorder and Brenda took the microphone and held it up for different people to talk into it. Apparently in the twelve preceding sessions she had learned quite well what it was for.

On tape (111) Brenda demonstrated her understanding of our equipment and our roles. We were ignoring our things while we ate some ice cream. Brenda said, "tape, tape", then held the microphone up to Suzanne's mouth and said, "word, word, word, word, word." She then got the notebook and as she handed it to Suzanne said, "paper, paper, paper, paper, paper" then "pen, pen". She then picked up the whole tape recorder and gave it to me and said, "tape, tape".

I feel it would be a serious mistake to underestimate Brenda's awareness of the presence of our little equipment and its purpose. The family does not own a tape recorder of any kind and the mother says that Brenda only knows about them from the one we brought. What is more, except for the first time we recorded, we haven't played recordings for the children and in that first session Brenda was asleep when we played back the tape for Charlotte. Brenda, then, couldn't have any direct knowledge that the tape recorder could make any noises at all, let along words. She did know, however, that its function had to do with saying words into it. This is in contrast to Bloom's (1970, p.16) claim that "the children accepted the presence of the recording equipment as a natural extension of the investigator and they were unaware of its purpose."

II.1.4 Summary

This study looks at the interaction between a primary subject, Brenda Wong, and four secondary subjects, Charlotte, the mother, and my wife Suzanne and me. These interactions take place in Brenda's home and are recorded on a cassette tape recorder while handwritten notes are taken to supplement the tapes with nonlinguistic contextual information.

II.2 First Level Selection

Since at the beginning this work was largely exploratory, I had few theoretical preconceptions to influence decisions about selecting data for study. Decisions about what to record and when, what to transcribe and how to encode the data for further manipulation were mostly made on the basis of convenience, and simply evolved with time. What follows is a detailed discussion of the mechanics of the collection and sorting of the data.

II.2.1 The Recordings

The first tape made was a full hour (two sides of a C-60 cassette). It was begun while Brenda was not present. I recorded the first half hour without her so that I would have a segment of tape on which she was not a participant. Since I had made no previous decisions about what I would consider relevant to my study I taped a continuous hour thinking that later unimportant sections could be edited out. As the taping progressed over several weeks it became clear that many things considered irrelevant on first analysis became important for other reasons later. For this reason a regular program of always taking a full thirty minute tape without interruptions seemed preferable to stopping the tape and starting it. This, of course, relieved me of having to make any decisions at the time of taping about the relevance of any segment of interaction.

When the study was begun it was impossible to find time to record any more frequently than once a week. This, then, was the pattern which became established. A continuous thirty minute recording was taken once a week on the same day of the week and as near as possible to the same time of day. For the first group of recordings (BRENDA I) this was on Saturday just after Brenda's morning nap. For the second group of recordings (BRENDA II) Tuesday afternoon was chosen. These decisions were based on my class schedule.

BRENDA I consists of a sequence of recordings taken in ten consecutive weeks starting at age 1;0.2 and ending at age 1;2.5. One further recording was made two weeks later. In the discussions that follow the first eight sessions of this group of recordings are referred to as BRENDA I. I began this group of recordings as an exploratory study with the intention of looking at the development of intonation during the one-word period. Because of course papers and examinations and then three months of fieldwork in Alaska (which was unrelated to this study), it was five months before I was able to return to study Brenda. The second group of recordings (BRENDA II) was made starting five months after BRENDA I when Brenda was 1;7.2 and covered eight consecutive weeks up until age 1;8.21. BRENDA III (age 1;10.17) consists of two recordings taken two months after BRENDA II as a follow-up. Another single recording taken again two months after that is BRENDA IV (age 2;0.12).

The two main bodies of data, then, are BRENDA I and BRENDA II, with the few tapes of BRENDA III and IV added as a follow-up. This follow-up is continuing but is not taken to be a directly relevant part of this report. The details of these recording sessions are given in Table 2.

II.2.2 The Transcriptions

The pragmatics of transcription had much to do with the decision to limit the recordings to one half hour each week. Since no decision had been made about what would be relevant to the study it seemed best to make a rather complete transcription of each tape. All of Brenda's utterances as well as those of all of the other speakers on the tape regardless of whether they were speaking directly to Brenda were transcribed. The amount of time involved in making these transcriptions made it impossible to do any more. I considered it very important to make all of the transcriptions within, at the most, several days of when the tape was taken. In working with the language of such a young child the context of any utterance is crucial to determining both meaning and appropriateness and much of the contextual transcription depended on my memory of the situation. In addition to contextual information, a certain amount of "getting into" the transcription for any tape made the task easier. I felt that if I waited beyond any new recordings for a transcription I would run the risk of extrapolating later forms into earlier, less developed forms.

II.2.2.1 Technique of Transcription

The tapes were transcribed using the Sony TC110A and a Sony DR-7A Headphone adapted with cassette recorder miniplug. The headset considerably improved the phonetic detail and audibility. The transcriptions were written out on the back of discarded computer print-out paper which was wide enough to allow six columns (vertical), one for each speaker and one for notes on the nonlinguistic context. The transcription for Brenda was in phonetic notation. Her intonation was also transcribed. For other speakers an orthographic transcription was used. This initial transcription was made in one session usually--in most cases the same day as the recording.

II.2.2.2 Phonetic Transcription of Brenda's Utterances

In making these transcriptions I felt increasingly dissatisfied with the set of symbols I was using. I felt, as Drachman (1973) has expressed, that the standard phonetic symbols developed for adult speech were simply inadequate for a narrow transcription of child speech. The symbols I used were largely those of the International

Phonetic Alphabet but with a number of diacritic symbols added of my own invention. For example, a symbol was needed to indicate an ingressive airstream in several cases. Since making these transcriptions a working paper of the Stanford Child Language Project (Bush *et al.* 1973) has come to my attention in which a very useful set of diacritics for use in conjunction with IPA symbols for transcription of child speech has been developed. Although there are some differences between the symbols they have developed and the ones I have used, on the whole it is clear that the Stanford group has been encountering the same phonetic difficulties.

The particular areas in which a narrow transcription was difficult were in the intervocalic consonants and in the initial consonants where voicing was a consideration. A characteristic of the intervocalic consonants that was difficult to transcribe was a lack of constancy. Intervocalic consonants often sound like a series of transitions from vowel to vowel with the closure and amount of frication varying too quickly to be easily assigned any one symbol. On the other hand the initial consonants shift freely between voicing and aspiration. If one symbol is taken to represent a voiced consonant, e.g. [d], another to represent a voiceless consonant, e.g. [t], and a third to represent an aspirated consonant, e.g. [t^h], it is often difficult to assign any one of these to a particular segment. Both of these problems seem to be the result of the same process--that is, incomplete control of the vocal apparatus.

The work begun by the Stanford group points the direction for essential research into this area of child phonetics.

II.2.2.3 Intonation Transcription of Brenda's Utterances

When I began transcribing I had an interest in watching the development of stress and intonation, thinking they later might have importance in making syntactic distinctions in early construction as had been reported by Miller and Ervin (1964). Having had some years of background in musical dictation, my first approach to transcription of intonation was a musical notation. Since I had no idea what might become significant I transcribed in detail on a music staff the exact pitches and relative rhythmic patterns using standard musical notation. By making a copy of the tape at 7 1/2 inches per second and then slowing it to half speed the utterance was lowered by one octave and played at half the speed. It was then fairly easy to transcribe the pitches with a considerable degree of confidence.

This type of notation was used for the first five tapes. It was later abandoned when a group of patterns was evident. Those patterns allowed a simpler set of symbols to be used. Since at the same time the number of utterances on each tape was rapidly increasing there was the added pressure of the time it took to transcribe each tape phonetically. The chapter on intonation (IV.1.1, p. 85) will discuss these intonation symbols in detail.

II.2.2.4 Contextual Transcription

During the recording sessions, Suzanne kept notes of the nonverbal and inaudible context. Naturally, the amount that can be written into notes is very limited and there is the second problem of synchronizing the notes with the tape in making later transcriptions. For each note Suzanne recorded the number on the tape meter. I found that it was very easy to learn to make spoken notes directly onto the tape at the time and this greatly reduced the need of other notes. Throughout this study, particularly in this area of understanding the non-verbal context of an utterance, the need for videotaping was felt.[1]

II.2.2.5 Orthographic Transcription

All of the speakers other than Brenda were transcribed in a modified English orthography. In BRENDA III and IV Brenda's utterances were also transcribed orthographically. Certain substitutions for standard orthography were made when I felt that it was important to mark a difference in formality or style. For example, gonna replaced 'going to', dis and dat replaced 'this' and 'that'. A phonetic transcription was made in a few cases where the utterance was unintelligible but audible or where there was some unusual pronunciation that would be missed in the orthographic transcription. These orthographic transcriptions of Brenda's speech might better be called "orthographic translations" since what they preserve is meaning and word order. Phonetic shape is lost. In general it seemed best to regard the transcription of other speakers as a guide through the interaction, and an exact phonetic transcription would not only take a lot of time to write but would be cumbersome to read.

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[1] Unfortunately, the cost of videotaping was prohibitive.

II.2.2.6 Other Encoding of the Transcription

The tapes are numbered consecutively (1 through 17). Side one and side two of each tape is indicated by a 1 or a 2 after the tape number. For example, (101) represents tape ten side one, or (071) represents tape seven side one. As can be seen in Table 1 for the recordings of BRENDA I, each tape was used for two weeks. Starting with (071) a full hour was recorded each week with only the first side taken for data in this study. Side two was held in reserve in case it was felt that further information was desired for any particular week. The tapes of BRENDA III and IV were fully transcribed for both sides to increase the amount of data for each session since there was a two month break between sessions.

Each utterance on each tape transcribed was numbered. In most cases this raised no particular problems since the utterances were clearly isolated from each other in the early stages. By BRENDA III it became a real theoretical problem which will be taken up in this chapter, section three (II.3, p. 26). Whatever the status of the utterance under any particular number, the number indicates its relative position on the tape. References to specific utterances, then, will be made by tape number and utterance number. For example (051)137 indicates the 137th utterance on the first side of tape five.

A further type of encoding developed somewhat by accident. The first transcription was written out in black ink. The context was written in with green ink to make it easier to separate from the voice transcription. The utterance numbers were written in red ink. In that case it was to keep from confusing the phonetic transcription and its diacritics with the numbers on an increasingly crowded transcription. The footage markers were noted in spaces of five feet in the left margin. The phonetic transcription, then, was made in a first listening. The utterance numbers and footage markers were made in a second listening. The intonation transcription was made in a third hearing. It often turned out that differences were noted in blue ink to separate them clearly from the original transcription. In this way it could be seen at a colorful glance to what extent the initial transcription of a particular utterance had withstood the minimum of three hearings. Table 3 gives a facsimile page of transcription.

II.2.2.7 Further Data Sorting

The next step was to get the data into a form that could be sorted using a computer. After making the transcriptions as described, all of Brenda's utterances for tapes (012) through (061)--BRENDA I--and tapes (071) through (141)--BRENDA II--were keypunched indicating tape number, utterance number, phonetic transcription, and intonation symbol. For BRENDA II a "gloss" was added for each utterance, i.e., an English adult translation of what Brenda said. These "glosses" will be discussed in more detail in several other sections. This information on the data card allowed a simple program to sort Brenda's utterances by chronological order, by intonation type, by phonetic form, and for BRENDA II by "gloss" or word that was understood by adults. Printouts made on the basis of these sorts formed the data for all of the context-free parts of this study. Incidentally, it should be mentioned that it was in working with these same context-free print-outs that I began to experience frustration with the skeletal and unrealistic appearance of the data. Context-free print-outs eventually proved to be useless for anything but the most superficial studies of phonology and intonation.

One final type of sorting was to calculate the mean length of utterance for some of the sessions. Brown (1973) has argued for the use of the mean length of utterance (MLU) as a useful comparative indicator of development. Calculating according to Brown's rules (1973, p. 66) for the tapes of BRENDA I, (012) age 1;0.2 through (061) age 1;2.5, the MLU is 1.0. For BRENDA II the MLU does not yet rise above 1.0. In the last several sessions a few words have -ing which according to Brown's rules should be counted as a separate morpheme. However, in these cases, e.g. hiding, -ing does not appear to be productive since the form hide never appears without -ing. If -ing is counted the MLU for (141) would be 1.11. I feel 1.0 is more representative of the data.

For tape (161) age 1;10.17 several problems in counting arise. Again there is the problem of -ing. It still does not appear to be productive. A second problem is caused by words such as tape corder. Brown indicates that this should be counted as one morpheme. However, in this case both tape and corder appear independently. Of course, it is possible that there are three monomorphemic words tape, corder, and tapecorder. For the sake of being complete the MLU's of (161) can be broken down as follows:

(1) MLU 1.28 if *-ing* counts 0, *tape corder* counts 1.

(2) MLU 1.34 if *-ing* counts 0, *tape corder* counts 2.

(3) MLU 1.46 if *-ing* counts 1, *tape corder* counts 1.

(4) MLU 1.52 if *-ing* counts 1, *tape corder* counts 2.

In future references to the MLU of (161) I will use (3) 1.46 as the MLU since this is the one derived from a literal reading of Brown's rules and is likely to compare best with other investigators. Finally, for (171) age 2;0.12 the MLU is 2.29.

II.2.2.8 Summary

Tape recordings were made of one thirty-minute period each week for a ten week period (BRENDA I, age 1;0 to 1;2) and then later for an eight week period (BRENDA II, age 1;7 to 1;8) and these two main periods of study were followed up at two month intervals. The full thirty minutes of each tape were transcribed phonetically for Brenda and orthographically (with some modifications) for the others. The transcription was made within the same day or, at the latest, the following day. The data transcribed in this way were keypunched onto computer data cards for computer sorting. At this point my selection has included a phonetic transcription of Brenda's speech (both unintelligible and intelligible), an indication of intonation contour, notes on context, and all other speech in orthographic notation. This first-level selection has excluded any sounds that did not get recorded on the tapes and any information about context that was not written into notes or that is not recoverable from the sounds on tape. In the transcriptions the exact pitch of utterances is not included nor is the phonetic shape of the adult utterances. These are recoverable, however, since they are recorded on the tapes. The original tapes, the hand written transcriptions, and the computer print-outs are the three main types of data on which this study is based.

II.3 Second Level Selection

It is common in the literature on child language to find the use of apparently unconscious techniques of filtering the data to be studied so that the data will ultimately be amenable to the investigator's own intuitions. These techniques form a kind of filter between the primary data and the data accepted for study, the effect of which is to severely restrict before study anything that is outside the investigator's competence--or to be fair, I should say--extended competence.

II.3.1 Filtering of Data

Most of the now standard sources on child language have used some means of filtering the data of the study before analysis. In the earlier diary studies this has been inevitable because of the limitations of hand written notes. Anyone who has transcribed a tape recording of speech is aware of the many repetitions that are necessary before the transcription represents the full detail of the original. Leopold (1953, 1971, p. 135)[1] complains that child language has only

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[1] In several cases two dates are given in reference to a publication. The first date is the original date of publication. The second date gives its appearance in a collection. Page numbers refer to the collection.

> engaged the marginal attention of linguists. Too often their references to it have been casual and, on closer inspection, erroneous. The obvious requirement that reliable data must be collected before conclusions are drawn has too often been neglected.

Oscar Block is quoted in Jakobson (1968, p.19) as saying he was able only to "slightly observe" and "record little". Block continues, "Not only is it difficult indeed to grasp and to record the sounds that are produced, but to interpret them also entails large demands." The most recent examples of this inevitable filtering in diary studies are the studies of Braine (1963), in which the parents' notes are taken as the primary data, and the somewhat shocking recent study of Olmsted (1971). The active use of a filtering technique has never been more explicitly stated than by Olmsted (p. 59):

> It had to be decided by the investigator whether the child's vocalizations were recognizable as attempts to say something in the language or not...If the utterance was understandable to the investigator no interruption occurred, but if it was ambiguous, she would indicate by gesture (usually raised eyebrows) her state of indecision; then the mother would interpret the utterance if it was interpretable. If she did not find it interpretable, it was regarded as babbling and plays no further part in this project.

In all of the cases mentioned here the selection of data took place at the time of recording. As a result, whatever was not selected is not recoverable. Sarles (1972, p. 67) has summarized this approach in this way: "The decision concerning what to look at or consider, and what to throw out is usually made on *a priori* grounds which happen to fit into a given tradition."

In some studies a second type of filtering took place after the tape recording of data. In Cazden's (Brown et al. 1968, 1971, p. 404) study of expansions it is reported that "the tapes were transcribed by a secretary who was trained by a linguist on our staff and who was ignorant of the treatment assignment of the children." Another familiar example is Bloom's (1970, p. 17) explicit exclusion from analysis of "utterances that were wholly or partially unintelligible", "fragments of songs, rhymes or stories", as well as duplications and repetitions. Brown (1973, p. 56) reviews the process of selection of his group in which "713 consecutive complete utterances" were selected for analysis. In an earlier discussion (p. 42) Brown has made it clear that a complete utterance is, in fact, a sentence. In this case, then, everything that is not a sentence is being explicitly disregarded. It is important to note, however, that this type of filtering is not irrevocable. Brown points out that he was "continually discovering new kinds of information that could be mined from a transcription of conversation." (Brown, 1973, p. 53)

The attempt to determine the child's own system is perpetually frustrated by the fact that we have no access to intuitions about it. Of course, the method of study is to refer to adult intuitions as a means of breaking the closed circle of the child's system, and this amounts to the imposition of a kind of filter. This inevitable filtering is justifiable to the extent that the investigator is aware of it and does not allow it to operate any more than absolutely necessary. What I have found objectionable in many studies of child language is the imposition of filtering techniques at the stage of recording the data. In these cases utterances of the child have been disregarded because they did not overlap in some immediately intelligible way with the linguist's system. In my work I have found that although at first I could not fully understand Brenda's utterances, my understanding could be "stretched" by reference to context or the developmental history of a word, and in these cases things that at the first look were unintelligible at a second look would become intelligible.

II.3.2 Intelligibility

In the data of BRENDA II I found that for many utterances I could assign a "gloss". That is, I could recognize an adult English word that was very close to Brenda's word in both appropriateness of usage (as seen by its place in the context) and in phonetic shape. These utterances are commonly taken by adults as being attempts at adult words. Brown (1973, p. 106) has suggested that this amounts to taking "the parental rather than the behavioristic view of child speech." In making these glosses I was using the technique that Bloom (1972, p. 28) has outlined as follows:

> What I did was to make the decision that I could have some idea of what the child meant by what he said, not that I could reach the meaning of a particular utterance. But I could make a judgment about the semantic intent that underlies particular utterances that children make, and that I could do this by relying on clues from the context and behavior in speech events.

> So that rather than simply looking at and recording only what the child said, I also took into consideration what it is he was talking about and made certain inferences about the semantic intent that underlies what he is talking about.

I did this assignment of glosses only after all the tapes of BRENDA II were collected and transcribed. I found that for the eight sessions the intelligibility of Brenda's utterances improved considerably with time. Table 4 gives the percentages and actual figures for each tape. In the first session of BRENDA II (071) 45 percent were intelligible, whereas in the eighth session (141) 84.6 percent were intelligible. Even accepting a wide margin of error on my part and Brenda's there is a clear difference between these sessions. This, of course, is what we would expect for a normally developing child.

I found out in this assignment of glosses, however, that some utterances that were unintelligible to me at first later became intelligible. There are two types of information that make this possible. The first is information about the context and the second is the developmental history of a word. These two types of information are not clearly separable, however, since the developmental history of a word becomes a part of its context. Several examples should make this clearer.

(091)44 dæʔkʰə̥
(R) Duck?
45 dakʰ
46 šɪm
47 šɪm
48 šɪm
49 šɪm

In this first example utterance 44 is marginally intelligible. Utterance 45 indicates that my guess was right, that is, 45 was said as confirmation. 46 - 49, by further expanding the context of duck to swim, added semantic confirmation to the phonetic confirmation. This kind of interaction was very frequent between Brenda and other speakers. It is, perhaps, the primary natural means of establishing glosses.[1]

In some cases Brenda used a word which was either unknown to me or I had no knowledge that Brenda knew the word. Otemba is the Japanese word for 'monkey'. At the time of (091) I did not know the word. As Brenda climbed up on a settee she said (091)226 [tʰɛmbə] 227 [tʰɪmbə]. I transcribed these two utterances and, then, during the next visit I asked the mother if she knew the word. The mother said it was Japanese for 'monkey' and explained that Brenda always said otemba when she was climbing. In (131) a confirming example was recorded.

(131)315	tʰɛmbəʔ	(B "climbs" tree while M holds her in position)
316	tʸɛmba	(M) Otemba.
317	məŋkʰi	
318	məŋkʰi	(R) Who's the monkey?
319	mi	
320	mi	

In this example otemba was a word I did not know at first, and for that reason it was unintelligible to me without the additional context of the mother's explanation. In the next example sick was familiar enough but a combination of phonetic instability and a context in which the use of sick could not be established with certainty made utterances 128 - 130 quite unintelligible to me.

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[1] For further discussion see V.6.2, p. 119.

(071)124	pitibebiii	(B is holding a doll)
125	bebi	
126	pʰæk	
127	p̨ʰi kụ	
128	s	
129	ši kę	
130	ši k	
131	bi	

The following sequence of utterances which were recorded a week later (081) indicate that Brenda knew the word sick at that time. Further, the mother reported then that Brenda often pretended that she or her doll were sick or hurt and would go to the mother for medical attention. The acceptable remedy was usually a piece of band-aid tape over the spot indicated by Brenda.

(081)166	tʰipʰ	'tape'	(B points to band-aid tape on her leg)
167	tʰipʰ	'tape'	
168	bwi ndah	'Brenda'	
169	hɔṭo̯	'hurt'	
170	maĩʔĩ	'Mommy' ('my'?)	
171	maĩʔĩ	'Mommy'	
172	bænĩʔi	'band-aid'	
173	hɔʔtʰɨ	'hurt'	
174	hɔʔ	'hurt'	
175	x x x	?	
176	hət	'hurt'	
177	šikʰ	'sick'	
178	šikʰ	'sick'	

On the basis of this use of sick it becomes plausible to gloss (071) 128 - 130 as 'sick' as well. Both the phonetic shape and context are appropriate. That is, in the first use of sick (071) Brenda is saying that her doll (pretty baby) is sick. (126 and 127, however, remain unintelligible.)

The utterances (071)128 - 130, [š.šɪkɛ̣.šɪk], give an example of a type of utterance sequence which is quite frequent. In these sequences a target word is repeated until a reasonably acceptable form is achieved. This type of sequence is discussed in detail later (III.6.1, p. 58). Here it is important to point out the similarity of this type of sequence, in which a word is repeated until the "best" form is pronounced, and the developmental history of a word. In some cases the "best" form was not reached until a week or more later. In these cases the early utterances could be established. One example will illustrate this type of connection.[1] On tape (111) [bəiš] is recorded nine times in sequence. I mistook this for bicycle, which Brenda told me was not correct. At the time of hearing the utterance it was unintelligible. One week later Brenda said the following:

(121)49	brɛnda		
50	šipʰɪʔ		
		(M)	Hm? Yeah, you thought lady was wearing blanket, didn't you?
51	baš		
52	baš		
			Yeah, on the bus, hm? Yeah.

The story, as reported by the mother, is that she took Brenda to the doctor's office on the bus, and that Brenda always sleeps on the bus. This accounts for Brenda's utterances. At the doctor's office Brenda had seen a woman wearing a skirt of the same pattern as one of Charlotte's blankets. This accounts for the mother's references to a blanket. In this case the form [baš] can be quite clearly established as bus. Knowing this, it is not unreasonable to gloss [bəiš] as 'bus' on the tape (111) a week earlier, if the context would also support this gloss. Fortunately, these utterances were recorded on tape. When I listened again I noticed that just before Brenda's nine repetitions of [bəiš], a motor vehicle of some kind can be heard passing in the street. It is probably this sound to which she is referring. At the time of recording and in making the initial transcription I had missed the sound altogether.

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[1] This example is quoted in full in V.6.2, p. 120.

The examples should be sufficient to demonstrate a number of ways in which the intelligibility of Brenda's utterances could be "stretched". Obviously, this intelligibility on the basis of phonological extrapolation and newly acquired contextual evidence can never be as secure as the immediate intelligibility of more mature forms well supported by immediate context. However, it becomes clear that at least some of the forms that might have been thrown out as nonlinguistic errors or "babbling" or noises are in fact systematic. And, of course, there is no telling how many more of the fifteen percent in the last tape (141) and the much larger percentage of the first tape (071) are in fact systematic but remain outside my ability to recover them by expansion of my own system, or how many would be understood if the boundaries of this study had been made slightly larger by increasing my knowledge of Brenda's development through such means as videotaping (to increase contextual references) or taping for longer sessions (thereby increasing the chances of finding a word in a variety of contexts).

Bowerman (1973) has also discussed this "stretching" of the investigator's understanding. She found that at first she had some difficulty understanding one child, Seppo. Bowerman says (p. 18) that "after some tutoring from her mother, however, I became familiar with her style of word alteration and was usually able to understand her."

Smith (1973), on the other hand, has effectively excluded all initially unintelligible utterances from his study by choosing not to tape record. He says (p. 10 FN2)

> the use of a tape-recorder is not as helpful as might be expected. It is no use having a perfect recording of [g̊ʌk], if you do not know whether it corresponds to the adult dog, duck, luck, truck, or stuck.

My point is just contrary to this--that it is important to have such utterances recorded because the investigator at the time of recording is simply not capable of understanding everything he is hearing, and some utterances of this type can be understood later.

II.3.3 The Utterance

A traditional bugaboo of linguistic studies has been the clear definition of an utterance. In the early stages of my study it was not a problem. Brenda's utterances were almost all one or two syllables bounded by considerable stretches of silence. There were a few in the data of BRENDA I that were long singing-like strings but even these were reasonably clearly defined.

In BRENDA II it was not always so clear. A number of times there was a close sequence of words that I classed as separate utterances. However, these were, in fact, said in one breath group (as far as I could tell from the tapes), and on either side there was silence. In contrast (141)129 [bəmʔ:pʰ.mi], bump me, included within one utterance a fairly long silence and possibly even a breath.

It became clear to me that my idea of an utterance was not that classically desired objective utterance of the speaker's competence but rather an extension of my adult English competence. I had classed successive instances of the word 'Brenda' as separate utterances no matter how closely they followed each other because in my speech 'Brenda Brenda Brenda' is not a sentence. On the other hand, I did take (141)129 as a single utterance because my extended competence can accept bump me as a child's paraphrase for my 'I bumped myself'.

I can't say whether this has made any real difference in this study, although I can imagine some differences it might make. If only complex utterances were accepted for syntactic study, (141)129 would be accepted, whereas if separated into three separate utterances it would not. The domain often accepted by linguists for study is the sentence--which on the whole is taken as equivalent to the utterance.[1] In this study, particularly in the section on constructions (Section III), this domain has been extended considerably.

To divide Brenda's speech into utterances, and study only separate utterances, imposes some restrictions on admissibility for study that may really be very natural. After all, if the child's language only becomes communicative to the extent that adults understand it, perhaps we should only want to study that part of it that is immediately communicative. This has been the almost unconscious approach of child language development studies up to now. On the other hand, if we want to get a fuller idea of what the child's competence is at any stage we need to severely restrict any pre-study systematicisation. Fortunately for this study, Brenda's speech didn't reach the complexity that would have called for a whole scale investigation of this problem. I have grouped very few longer strings as single utterances. I have not made the utterance the criterion for admissibility to the study. I have tried to look at the larger speech event and place the whole set of utterances within this context for study.

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[1] This point is discussed in IX.3, p. 229.

II.3.6 Summary

A common weakness of studies of the development of language has been in the area of data collection. Data have been filtered before study by using too broad a transcription, by accepting only what is quickly intelligible and by decisions about what constitutes proper units of study. This study has tried to avoid some of these weaknesses by frequent reference to the original tapes and narrow transcriptions, by the inclusion of unintelligible utterances in discussions of Brenda's system, and by reference to the contextual setting of utterances chosen for detailed study.

SECTION II

Background for Vertical Construction

The chapters of section II treat, in order, Brenda's phonology, intonation, discourse redundancies (that is, imitations and repetitions) and finally discourse and the adult speech context. The presentation can be seen to begin with a focus on Brenda's system, to move then to a focus on interactions between Brenda and adults, and then finally to focus on the adult system with which Brenda is interacting. I have used "focus" intentionally since I mean to imply that the other aspects are always present in the picture. In speaking of Brenda's phonology, for instance, I found it impossible to avoid reference to the adult system. Indeed, it is only by reference to the adult system that I have been able to gain access to Brenda's system through the use of translations or glosses of her utterances. At the other extreme I will show that the adult system in these studies has been greatly influenced by Brenda in the interaction with her. For these reasons I have spoken of the shift of focus from Brenda at the beginning of section II to the adults at the end of section II.

Since the title of this study indicates that it is about construction, I should make it clear why this long section on everything but construction has been included. There are two reasons. One is that in the developmental history of this study my ideas about construction came out of my grappling with the general problems I am presenting here--problems ranging from phonology to discourse.

I feel that if the reader is given enough detail about the background of this study the conclusions will come about somewhat unaided. The second reason is that many of the arguments I make later in discussing construction are based on a general knowledge of Brenda's phonology, intonation, and ability to interact with other speakers in discourse. Section II is presented so that the reader will have a broader base of understanding of Brenda's speech. To adapt a metaphor from Bickerton (1973), section II presents the earth from which the ore of construction is mined. A reader interested in the ore, of whatever earth, may be well advised to go directly to it in section III and only refer back to section II when impurities are discovered.

In the chapters that follow, the approach I have taken is a chronological presentation. I look at BRENDA I (age 1;0.2 to 1;1.22) and BRENDA II (age 1;7.2 to 1;8.21) in that order. It should be remembered that BRENDA I and BRENDA II are both within the so-called one-word period. For each chapter this chronological presentation is followed so that in turning from phonology to intonation for example, the reader should remember that the discussion will begin again at the earlier period. The alternative of presenting each period as a whole would lose the longitudinal continuity which I feel is important for an understanding of the developmental process.

CHAPTER III

Phonology

III.1 BRENDA I, First Session (012) age 1;0.2[1]

As an approach to the phonology of BRENDA I, two sessions, the first (012) and the eighth (051), have been selected for detailed study. Although this neglects mention of the intervening sessions, it will demonstrate both the method I have used for all of the tapes and some general developments.

At the first session (012) Brenda's mother reported that she knew only a few words. They were "dada", "maman", "doll", "flower" and "nene". The mother then tried to prompt Brenda to say some of them by pointing to things and saying "What's that?" On the whole Brenda did not respond much to this prompting.

III.1.1 Utterance Types

Brenda made 66 utterances on tape (012). In addition to these 66 there was a stretch of about thirty seconds during which she cried. No attempt was made to transcribe her crying. The 66 utterances can be broken into six groups or types as follows:

(1) Baby talk. There was a group of 22 utterances that varied from [ne:ne:] (the most frequent phonetic shape) to [nə] and [e:nen]. The mother reported these to be Brenda's approximations for *nennen*, a Japanese baby talk form for "sleep" and, in Brenda's speech, 'milk', 'juice', 'baby bottle', and maybe 'mother'. This was the most common

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[1] (011) was recorded without Brenda as a participant for comparison to later sessions in which she was a participant. See II.2.1, p. 15.

form used (1/3 of the total) and Brenda was able to use it in two ways. She used it in the presence of the bottle, apparently to refer to it. She also used it when there was no bottle with the result of getting the mother to give her some more milk.

(2) Brenda originals. Utterances 53 through 58 demonstrate this type.

(012)53 awawawa
54 a:ba
55 awa
56 a:
57 æl^{n}
58 æ:

These utterances were accompanied by crawling toward the microphone on the floor and finally pushing it away. Brenda then went to the mother and raised her arms to indicate she wanted to be carried. When the mother picked her up she waved goodbye to me. It would be highly speculative to try to assign any adult gloss to this group of utterances. 'Away' might be suggested. The development of the form <awəu> later in BRENDA I largely with the meaning of 'I want' or 'again' might indicate a meaning of this sort here, even though the semantics of this situation is more the negative 'I don't want'. The point to be made is that there is probably no adult word or sentence to which this form of Brenda's corresponds. Or if there is, there is no way of knowing what it might be. It seems more plausible to say that it is original with her, that she has invented an utterance to accompany actions of desiring or rejection. This type occurred 9 times in (012).

(3) Approximation of adult word. 21 and 22 demonstrate this type. The mother is holding Brenda. Brenda looks at a small doll on top of the T.V. and says,

(012) 21 da: (whispered)
      22 da: (loud)

Since there was no immediately preceding attempt to prompt Brenda to say doll it may be a spontaneous naming of the object. (But see V. 2, p. 101 .) The phonetic form is both stable for the two utterances and recognizable to adults as corresponding to the adult word.

(4) Imitations. An example of this type occurred when the mother said, "That's a hakata doll", and Brenda said,

(012) 10 ka:

It should be pointed out that the mother's "hakata" carried heavy stress on the second syllable, which seems to be what Brenda was imitating.

(5) Long singing utterances. There were two of these, 28 and 49. 28 was the longest with 15 syllables.[1]

(012) 28 pa: læ lænəbætænætagabatwagæ gæ sæ

This was in marked contrast to all of the other types. Of the total of 66 utterances only ten were longer than two syllables: five of those were three syllables, three were four syllables. The justification for calling these two long utterances "singing" was the intonation patterns and the context. The mother had told us a story about how Charlotte had seen a man on T.V. singing into a microphone and said that he was singing into an egg. The context of 28 was my saying, "Do you know what this is? It's not an egg." I held out the microphone toward Brenda and it seems as if she then tried to sing. She then looked first at the T.V. and then at the piano.

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[1] On the basis of the absence of final consonants in the predominant short utterances I have used a CV structure as my working definition of a syllable.

(6) The others. It is not surprising that the miscellany should include 30 utterances--almost half of what Brenda said. It is simply impossible to be assertive about these since there is little contextual evidence to place them in any of the groups above. They can be described though as being less regular--that is both in the sense that they occur mostly as isolated utterances with no repetitions and in the sense that the phonetic variation is wider than for the first three groups noted above. The phonetic variation does not, however, go outside a fairly delimitable area. In the discussion to follow, what is said about Brenda's system is to be understood as including as well this unintelligible miscellany.

III.1.2 Words

Up to now I have avoided calling any of Brenda's utterances words. Before doing that we need some definition of "word". For the purposes of this study I take "word" to mean a systematic matching of meaning and form. Later, when the forms become more complex, it becomes a problem to make a distinction between utterances that are words and utterances that at some higher level are constructions made up of words. About the same time, the problem of the discrimination of the elements of which words are made up emerges. For this early stage, however, there seems little need to try to distinguish different levels of form and different levels of meaning. For Brenda's system it seems that some of her "words" correspond to adult sentences, some of them to adult words. It is this apparent lack of distinction that has led me to the very general definition above of Brenda's "word" being any systematic matching of meaning and form.

III.1.3 Determination of Form--Phonetic Variability

The traditional means of determining to what extent phonetic variation is allophonic variation is to ask for a "same or different" judgment from the informant; that is, to vary the form and ask if the meaning remains the same. This seems to be out of reach for an investigator working with very young children. Meaning is not reported but only inferred by the investigator from the context. Utterances like (012)53-58 become very important in determinations of form.

(012)53 awawawa
54 a:ba
55 awa
56 a:
57 æl^{n}
58 æ:

We have to assume[1] that the child in the succession of utterances is repeating herself. If we accept that assumption, then we can say that the variation between [w] and [b] in 53 and 54 is not significant. We are further accepting that the reduplication is also not significant. We can see that the variation between [a] and [æ] and finally between

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[1] This does not appear to be an important assumption, perhaps, until this same context is later invoked as being evidence for construction.

[v], [b] and [l^n] is not significant. This gives us our first step toward understanding Brenda's system.

Carrying out the same procedure for another form, <nene> we find that [e] varies with [ɛ] and [æ], but that [n] varies only in length, and that this word with two exceptions is always in the reduplicated form.

Finally for Brenda's third word "doll" we find no variation. It appears twice as [da:].

III.1.4 Homophony or Semantic Variation

On the other side of the definition, once we have found the limits of phonetic variation for a particular word in a more or less definite context, how do we consider phonetically similar utterances in which the context is unclear or actually different? Brenda's most common word in this session was <nene>. It occurred with considerable regularity in places where it could mean 'milk', 'juice', 'sleep', 'mother', or maybe other things, since it also occurred where no specific content could be determined. In this case it seems reasonable to think that this is one word with a wide range of meanings--all of them certainly related and of central importance to an infant's world. 'Nurture' would, perhaps, be a reasonable gloss of the semantic space of this word. We would expect then to see the process of development as a process of the successive differentiation of both forms and meanings.

III.1.5 Brenda's Words

The surest way to determine meaning is by reference to a clear context. This has pointed to the use of forms that are repeated in a constant context as the best way to look at phonetic variability. Further, the spontaneity of an utterance is useful in separating Brenda's productive system from her ability to imitate. These two factors limit the study of Brenda's phonology to the study of her most frequent words. These words can be checked against other forms but it is difficult to say anything about the systematicity of isolated forms--especially when the context cannot be well established.

For these reasons we can then refer to Brenda's words at BRENDA I as being those forms that occur at least frequently enough to be checked against each other for variability of phonetic shape and in varying contexts for range of meaning. We can see, then, that of the six types of utterances given above (1), (2) and (3) can reasonably be considered to be words. The others are either not words or can only be tentatively considered as such. In the first session (012) Brenda has three words that make up slightly more than half the total. These words are <nene> ('milk', 'juice', 'bottle', 'mother', 'sleep'--i.e. 'nurture'), <awa> ('I don't want', 'I reject'), and <da> ('doll'). These spellings are not to be taken as phonemicizations but rather approximations of the most common form. This type of spelling is indicated by angle brackets (< >).

III.2 BRENDA I, Eighth Session (051) age 1;1.22

By the eighth session Brenda's system has begun to expand. There are a total of 183 utterances. Out of this total of 183 we can distinguish eight words that account for 153 utterances. The remaining 30 utterances are in the categories of imitated words and unintelligible utterances that may or may not be words.

III.2.1 Methodology

Several of these words deserve detailed study since they point up some methodological considerations. The most common word again is <awəu>. It occurs 49 times, i.e., more than 1/4 of the total. What follows is a selection of instances of this word and the context in which it occurred. In several cases the mother's response is included. Those utterances blocked together shared the same context.

(051) 2	awʌ	(Playing with ice cubes)
8	avau	(Reaching out to grasp Suzanne's necklace)
11	awa	(Reaching for necklace again)
27	awə	(Trying to pick up ice cube)
28	æwəu	
29	awəu	
33	avə	(Reaching for Suzanne's necklace)
34	awa	
35	dævəu	
36	æwəu	
37	æwə	
38	ævə	(No specific context can be determined)
39	avə	
40	æla	
53	ala	(Looking at pictures of food in book--sausage etc.)
54	ælə	
55	æy4	
		(M) You want?

134	avu	(Reaches out and grasps necklace)
135	avə	
136	avə	
137	ævəu	
138	aw	
139	æləu	
140	æwəu	
141	awə	
171	nʔ	(Tries to take off shoe)
172	awə	(M) You want it off? O. K.
173	nʔ	
174	awə	(Gets shoe off and throws it away from her) (M) You don't like it.

The meaning that was suggested for <awa> in the first session can be seen more clearly now by the context in which this word occurs. On two different occasions it accompanies Brenda's attempts to pick up ice cubes. On three different occasions Brenda says this word as she reaches to grasp Suzanne's necklace. On the other two occasions the mother responds to this as if Brenda has said she wants something. In the last two instances it appears to be an action Brenda wants--that the shoe be taken off. It seems reasonable to consider the meaning of this word to be quite close to that expressed by the adult form "I want". The phonetic similarity, of course, is striking.

The following frequent words pose some problems. First a group of examples will be given and the discussion will follow.

		(R) What's this?
(051) 26	dæyi	(R hands B the hakata doll)
30	devəu	(B holds doll in hands)
31	dævlə	
32	dæwə	

46	edi	(Looking at magazine picture of woman's face)
47	dedi	
48	dædi	
49	dædi	
50	dædi	
51	dedi	
52	dædi	
61	dædi	(Picks up magazine--it is Daddy's magazine)
111	dau	(Spills juice while drinking and looks down on floor)
112	dawu	
169	čæyu	(S gives B doll)
178	dædi	(M) Daddy? Daddy not here. Where's Daddy?
179	dedi	
		Uh huh? Where?
180	ediˀ	
		Daddy at work.
181	dæyi	
		Uh huh.
182	dæd	
		Hai. Hai. (Japanese *yes*)
183	ædiˀi	
		Uh huh. Every morning she wants to go out with Daddy.

What is being questioned here is whether there is one word or more than one word in the examples above. One would like to think that Brenda has two words, <dædi> ('daddy', 'picture in a magazine', 'baby'--on the basis of the previous session) and <dæyu> ('down', 'doll'). In the case of the first word there would be the problem of homophony since it is hard to imagine grouping *daddy* and *baby* and pictures in a magazine semantically. However, on the basis of the dialogue between Brenda and the mother we see that for the mother, at least, [dædi], [dedi], and [dæyi] are all taken to be the same word with varying form. If this represents successive instances of the same word then the two groups have to be classed together. It is plausible that 181 is either an error of some kind or that the mother takes it wrong. Since it is the only instance of the [y] occurring where we would expect [d] an error is not unlikely. Also the fact that the dialogue goes on and on without any evidence that Brenda feels she is being understood may indicate that she was either saying something other than daddy or that she was making an attempt to get these words clarified by intentionally violating her phonemicization to see what would happen. Whatever the reason, it seems that the most plausible solution is to consider these utterances as two separate words.

III.2.2 Brenda's Words

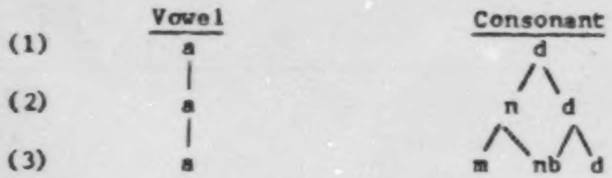
In session eight (051) Brenda has the following eight words. The spellings, again, are not to be taken as phonemic or phonetic but rather as the most frequent phonetic shape.

Word	Frequency	Meaning
awəu	49	I want, don't want
nau	29	no
dædi	22	daddy, baby, picture in magazine
dæyu	16	down, doll
nene	14	liquid food
e	10	yes
mæmə	7	solid food
ada	6	other, another

III.3 Jakobson's Stages

Since Jakobson's (1968) introduction of the concept of distinctive contrast to studies of child phonology, a number of investigators have voiced general support for his claims. (For example, Velten, 1943, 1971; Leopold, 1953, 1971) In general they have agreed that the development of phonology proceeds in a series of stages marked by successively finer contrasts. It is important now to discuss the system of BRENDA I in light of these stages.

To begin it is clear that Brenda at tape (012) age 1;0.2 is within the stage of "the first acquisition of words" (Jakobson 1968, p. 21). This is the starting point of Jakobson's stages. The first stage for Jakobson is that in which the maximum distinction between consonant and vowel is the only distinction. The second stage consists of a differentiation between two consonants, a nasal consonant and an oral consonant. The third stage brings a distinction in the consonants between a labial and a dental consonant. The following diagram illustrates these three stages using Brenda's most frequent phonetic segment as the representative.[1]



From Brenda's three words we can determine that she is in the second stage for the first session (012). In these three words we have clear evidence of a nasal/oral split in the consonants. Brenda has <nene> (sometimes [ne]) and <da>. There is no evidence for the further split of stage three, i.e., there is no word *<meme> nor *<ba>. A strict phonemicization, then, in Jakobsonian terms would give /nana/, /ada/, and /da/ for Brenda's three words, where n - d represents only a contrast of nasality and a any vowel that is not forward.

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[1] It should be noted that the only formal meaning of d above in Stage 1 is "consonant" and "forward". That Jakobson uses p to represent this is not in contrast with this use of d.

Jakobson's stage 2 allows two contrasts, nasal/oral (for consonants) and consonant/vowel (for segments). At this stage the forward/back contrast parallels the consonant/vowel contrast so that all consonants are forward and all vowels are back. Jakobson also assumes a word structure of CV or (in reduplication) CVCV. These restrictions would allow only the four words /da/, /na/, /dada/, and /nana/. We can assume Brenda's <nene> and <da> match Jakobson's /nana/ and /da/, respectively. <dada>, which was reported by the mother (but did not appear on tape), matches /dada/. This leaves Jakobson's /na/ unaccounted for. This matching also does not account for Brenda's <awa>.

Of course, because a structure such as /na/ is possible does not mean the child has to have a word which makes use of it. It is even possible that such a word did exist but simply did not occur in my data. The other form, <awa> is somewhat more problematic since it is of a VCV structure. This implies a CVCV/VCV contrast, i.e. a contrast between /dada/ and /ada/, and /nana/ and /ana/. This latter form, /ana/ does not occur.

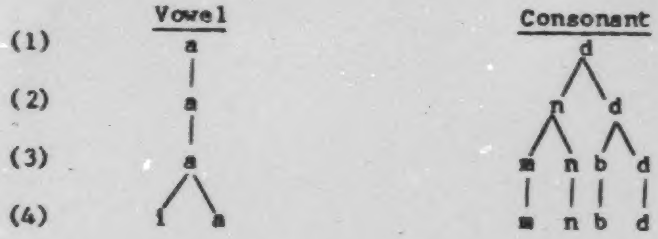
The only conclusion is that Jakobson's stage 2 indicates the general nature of Brenda's system but that if his claims are taken literally they are not substantiated in this analysis of Brenda's words.

III.3.1 Phonetic Conditioning

In discussing the variability of the vowels it was noted that in <nene> [e] varied with [ɛ] and [æ]. In <awa>, however, [a] varied with [æ]. Jakobson's solution to this type of problem is to claim that there is no significant contrast among vowels at this stage. If this is the case, then the question of the phonetic conditioning is raised. It can be seen that [e] and [ɛ] only occur after the nasal. [æ] occurs in that position as well as before [l^{n}]. [a] occurs after [d] and before [w]. This, then, points to the nasal being the condition for the raising and fronting of the vowel [a], which in my transcription is a low central vowel.

III.3.2 Jakobson's Stages in (051)

In looking at the eight words of tape (051), age 1;1.22, we can see that Brenda is now in the third stage but has not yet reached the fourth. It may be useful to recall the stages. The following diagram shows these stages through the fourth in which the wide vowel splits into a wide/narrow contrast.



Evidence for the third stage can be seen in the contrast between 56 through 59 and 165 through 168 below.

(051)56 m (Looking at pictures of solid food in book, e.g. fish and French fries)
57 mæ
58 məmæ
59 mɛmæ

165 nɛnæ (Drinking juice from cup)
166 nene
167 nene
168 n

These examples show a definite contrast between the labial and dental nasals accompanied by a semantic difference. The same split can be seen to have developed, although somewhat differently, for the non-nasal consonant. Many examples of <ava> have been given above (p. 47, 48). Below are some examples of the dental consonant.

(051)121 abə (Brenda's cup leaked and she held it up asking for another)
122 ada
123 ada
124 adðaʔ

The first instance, 121, may or may not be a [b]. It is somewhat unclear on the tape. The following [d]'s, however, are clearer. It looks as if the stage 3 /b/ - /d/ split seems to be not exactly that but rather a split between [+continuant] and [-continuant]. That is, where we would have /b/ we see on the surface [w], [v], [y] and [l] (as in p. 47, 48 above). For /d/ we have [b], [d], [dð], and [ð] in one instance. As can be seen in the case of the non-nasal distinction it is not as clear and definite as the nasal distinction nor as clear as Jakobson has claimed. Furthermore, what are we to make of the apparently real distinction between <dædi> and <dæyu>? Jakobson makes no mention of glides at this stage. Perhaps on the basis of what we have seen for <awa>, i.e., that [w] and [y] are in variation, we may say that <dεyu> could be represented as /daba/. This would not cause any formal difficulties but would require us to believe that /daba/ could be the child's deep representation for the adult down or doll.

It could be argued that the third stage has not yet been reached. It could be said that the [b] in 121 is evidence that the split has not taken place. If the third stage has not been reached yet then <dεdi> and <dεyu> are in fact the same word. But so are <mεmə> and <nεnε>. Jakobson's system of contrasts does not admit of successive approximation, and yet that looks like what is happening with Brenda's system. It appears that for nasal consonants she has reached the third stage in which there is a labial/dental contrast, but for non-nasals the contrast is in the process of being established. For the words <avəu> and <ada> there is a contrast of sorts. One of the meanings of <dεdi> is 'baby', and if the contrast were fully established we would expect Brenda to begin saying something like [bebɨ]. However, if we look at the next week (052) Brenda has several words with a [b], e.g. [ba] (looking at a balloon). As much as four weeks later (511) she is still insistently saying <dedi> for baby. By then the third stage is definitely established and the only explanation that can be put forward is that this particular word has remained as an idiomatic anachronism in Brenda's otherwise developing system.

III.4 Apparently Non-systematic Words

It might be argued that Brenda's system is really developed much beyond stage 3 and that examples which would be needed to establish

Jakobson's stages simply did not occur in this half hour. If that is true, then any final analysis of any child's system will always be out of reach since there is no way to assure that one has been fortunate enough to uncover all the relevant examples. Jakobson's claims, however, are based on general principles that should be evident in any of the utterances available. For this reason the analysis to this point has been of the few frequently repeated words.

A serious problem arises, however, in looking at a number of words that occur that neither fit the supposed phonemic system nor can be demonstrated to be imitation. The details of imitation will be discussed below (V.1, p. 99). For now a small sample will illustrate the problem. In tape (021) Brenda says [čoda] (utterance 21). This corresponds well to the mother's Japanese chodai 'please give it to me'. There is no instance of this word anywhere on the tape before this. The phonetic clarity of the word as well as the appropriate usage (she was handing something to her mother) qualify it as a real word. Yet it seems to be well outside the <awa>, <da>, <nene> system of that period.

A second example is on tape (042)--23 [laulau]. The context for this is the presentation of a picture of flowers. No one in the preceding recorded context has said flowers so this can reasonably be thought to be Brenda's own word for flower. However the supposed phonemic system would have no means of differentiating this surface form from <dedi> since at that time only a nasal/oral contrast of stage 2 and the labial/dental contrast of stage 3 can be assumed.

These are only a few selected from a larger group of words that seem to violate Jakobson's claims in two ways. In the first type there is use of a word quite outside the phonological system that can be supposed for that period on the basis of the large group of more or less systematic words. In the second type there are utterances within the phonological system but in which a distinction apparently quite advanced (e.g., the dental/liquid contrast) is used appropriately. These data present a dilemma. The system may be developed well beyond that supposed on the basis of the large group of frequent words. But it remains impossible to determine that system because of the impossibility of knowing if all the relevant items have been found. On the other hand there may be a system such as Jakobson has claimed but within that system there is room for both non-systematic utterances (perhaps idioms) and successive approximation of later distinctions.

III.5 Conclusion to BRENDA I Phonology

To conclude this discussion of the phonology of BRENDA I we can definitely show that Jakobson's fourth stage has not been reached. In no case can we demonstrate a wide vowel/narrow vowel contrast. It does remain to be explained, however, how the [i] in <dædi> is consistently that vowel and no other. Also <e> 'yes' is always [e] and never [a] nor [æ]. In these cases phonetic conditioning is not a plausible explanation. This appears to be further evidence that, although there is no formal means of recognizing these consistencies in Jakobson's framework, there is nonetheless a preference for one non-contrastive segment over another in the child's system. It suggests that a conceptual framework that eliminates the concept of non-contrastive variation and successive approximation in fact is not representative of the developing system of a child in the process of learning a language.

Leopold (1953, 1971) has referred to this phenomenon as "pre-patterning". I have discussed it in some detail because I plan to show in the discussion of construction (VII.3.5, p. 156) that this same type of successive approximation that is operating in phonology is paralleled in developments in construction. This parallelism of development indicates that "pre-patterning" or successive approximation is an active process throughout the language acquisition process rather than specific to any particular aspect.

III.6 Problems of Data in BRENDA II, age 1;7.2 to 1;8.21

In the discussion of data filtering (II.3.1, p. 26) I raised several questions about how decisions are made in the selection of data for study. Here again the same questions come up but in somewhat more interesting detail. They are basically two questions: 1) what is a word? and 2) what is the system under analysis?

III.6.1 What is a Word?

The idea of phonology is to reduce phonetic variation to some more basic set of elements and a set of rules relating them. To do this some decision has to be made about the significance of surface variation; it is the "same or different" judgment. With a child as young as Brenda, one must be content with recurrences of the word in the same or similar contexts to decide if it is the same word. This does not solve all the problems, however, since sometimes a second decision has to be made about production variation which may not be the same as allophonic variation. Two examples from (071) will clarify the problem.

The first example is of the word bear which Brenda said while sitting on a toy bear.

(071)84 bæu
85 bɪæu
86 b^yæ

In this case it is not difficult to consider these all the same word and that [b], [bi] and [b^y] are in free variation, as well as [æ] and [æu]. The solution is as clear as one could hope for.

In the second example the problem of production is added. Brenda picks up her mother's shoe and says:

(071) 263 š
264 šɪ
265 š
266 šɪ š
267 šu
268 šuʔ
269 šuš
(S) Shoes!
270 šɭ
271 šɭ
272 šuʔ

Once 268 is reached it is clear that Brenda is saying shoe. How far back in the string can one go saying that it is phonetic variation, and what is the difference between that and the earlier production difficulties? It seems clear that Brenda is trying to say shoe and finally succeeds. Of these ten utterances how many are words? Are there two strings of repetitions, 263 through 269, and 270 through 272 culminating in the "word" or is this a unified set of repetitions? Decisions of this sort are always tentative. On the basis of pauses[1] it appears that 263 through 269 form a set and 270 through 272 form a second set. This seems to be true since in the first set Brenda needs seven repetitions to get the form pronounced well enough for Suzanne to understand. After Suzanne's "shoes", however, only three repetitions are needed to produce the "best" form. Furthermore the whispered vowels of 270 and 271 indicate that Brenda may have been practicing the form softly before risking a full voice pronunciation. This would suggest that even Brenda was aware of a difference between production variation and allophonic variation.

In a strict study of the phonology of a child's speech, then, we can only study forms that are intelligible in the first place, or which can be made intelligible by reference to context, and forms that we somehow judge to be free of production errors of the grossest type. What is left as the basic form of a word is what occurs most frequently, since that is our only basis for deciding. The words in this study of BRENDA II phonology are of this type in most cases. In Tables 5 and 6 the phonetic shape given is the best form that can be sifted out through this process. These forms correspond to the form given in angle brackets (< >) for BRENDA I. It should be understood that the phonetic shape given may not be the only one which may have occurred for a word given. Important differences have been given in parentheses.

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[1] See V.6.1, p. 118, for a fuller description of this type of sequence in the discussion of repetitions.

III.6.2 What is the System under Analysis?

In a system as varying and as quickly changing as that of a one year old child, some important decisions are made at the point of selection of the system for study. A study of the data from the full eight weeks would show developmental changes of considerable magnitude, but since many of these changes are irreversible, one would not want to consider all of the data to constitute a stable system, i.e., a synchronic system. On the other hand there is no lower limit one can place on the length of time covered to guarantee that no developmental change will take place. This study has taken each half hour session as an arbitrary synchronic whole and then looked at the development from week to week, particularly comparing the first session of BRENDA II (071) with the last session of BRENDA II (141). This is the same technique that was used for BRENDA I.

In the course of eight half hour tapes Brenda said 2940 utterances from which 319 words (types) can be identified. All of those words are not of equal value in a study of her phonology. Some of them are clearly more indicative of Brenda's own system than others. One means of deciding about Brenda's system is to look only at words that have occurred spontaneously. By separating these words from those that have followed another speaker's model we can safely eliminate imitation as an immediate source of Brenda's words. A second means of establishing stability in the corpus studied is to look only at words that occur more frequently than in just one session. This would have the effect of eliminating any words that might be remembered from just before the taping session and were in fact not really a part of Brenda's system.

The two categories of spontaneity and occurrence in more than one session will cross classify four groups of data. They are given in order of importance. This is also the order of frequency.

(1) Spontaneous words which occur in more than one session.

(2) Spontaneous words which do not occur on any other tape.

(3) Modeled words which are repeated in later sessions as spontaneous words.

(4) Modeled words which do not recur.

The term "modeled" requires clarification. When I refer to one of Brenda's utterances as "modeled" I mean that it may have been imitated but that I am not willing to assert that it was. The difficulty of deciding whether an utterance is, in fact, an imitation is discussed in detail in V.2.1, p. 102. "Modeled" means that a model for Brenda's utterance was present in the speech environment during the preceding five minutes. Obviously, Brenda may or may not have heard the model. If I call her utterance an "imitation" I have reason to believe that she did hear the model. I have used "modeled" to remain uncommitted. "Spontaneous" utterances are all those which are not "modeled".

The discussion that follows is a relatively context-free study of phonology. The very important questions of imitation and repetition which have been raised by the use of such terms as "spontaneity" and "modeled" have been deferred for fuller discussion in V.2.1, p. 102, on discourse redundancies.

Tables 7, 8 and 9 include data about this corpus. Table 7 is a list of the 118 words that were used in more than one session. With each word is listed the sessions in which it occurred. Table 8 gives the 201 words that occur in just one session along with the session number. Table 9 lists the most frequent words and the number of sessions each occurs in.

III.7 BRENDA II, First Session (071), age 1;7.2

At this first session Brenda had changed considerably from the end of BRENDA I, age 1;1.22. About five months had passed since the last sessions of BRENDA I. The total number of utterances had doubled. There were five times as many different words. In (071) Brenda used 44 words (types). They can be broken down as above into four groups as follows:

(1) 23 spontaneous words which are later found in at least one other session.

(2) 12 spontaneous words which do not appear later.

(3) 5 modeled words which later appear as spontaneous words.

(4) 4 modeled words that do not reappear.

Table 5 is a list of these words by the four categories. The table gives the adult equivalent and the best phonetic shape for both spontaneous and modeled forms. Eleven of the thirty-five spontaneous words were said by an adult after Brenda's first use and then repeated again by Brenda. This is the reason these two forms are given.

III.7.1 Stops in BRENDA II, tape (071)

There is a three way contrast in stops for place of articulation: labial, alveolar, and velar. There also appears to be a contrast either in voicing or aspiration but this distinction is not always clear. Looking first at the labials we could assume underlying /b/ and /p/. On the surface [b] is in free variation with [b^y]. [p] is found in [pu], blue. It is also found in the position before consonants [č] or [t^h]. [p^h] is found in all the places one would expect it from adult phonology, except it also appears in the word Brenda. There are no [b]'s in final position. From this we can see that although there is basically a distinction between /b/ and /p/ it is not maintained everywhere.

For alveolar stops the situation is somewhat clearer. We could posit /d/ and /t/. There are no [d]'s in final position. Since there were also no [b]'s in this position the question of word final devoicing is raised. This will be taken up after the discussion of velars below. In other positions /d/ is always [d]. /t/ is found as [t] in variation with [t^h] in final position. It is [t^h] elsewhere except in one word, Checkers, where [t^h] varies with [k^h] in initial position. Notice that this variation is in the position where the adult system has [č].

It seems fairly clear from the fact that there is a contrast in voicing for all three points of articulation in all positions in the word except the final position that what is taking place is neutralization of voicing in final position. Since there is no morphological evidence at this early stage to give further evidence of neutralization, my final decision was based on a combination of the regularity of the contrast in other positions and by comparison with what is expected from the adult system.

III.7.2 Nasals in BRENDA II, tape (071)

The nasals present the simplest and clearest segments in Brenda's system. We can assume /m/ and /n/ with one rule--that /n/ becomes [ŋ] before [g]. This is very much like the adult system. The modeled word, pen, is interesting. We see that there are two forms [pʰæ̃ʔ] and [pʰæ̃n]. In this case a nasalized vowel/nasal sequence is in variation with a nasalized vowel plus [ʔ]. If this form is compared with the spontaneous form of the same word pen [pʰeyɛn] it can be seen that what has been changed is length. This is, perhaps, evidence for the status of [ʔ] as the least marked consonant, at least in final position. Under conditions of rapid speech or, in this case, an attempt to produce a single syllable in the place of two syllables, other consonants are reduced to [ʔ].

III.7.3 Fricatives in BRENDA II, tape (071)

The only regular fricatives in Brenda's use are [š] and [s]. These could be assumed to be under /š/ with [s] occuring word final.

There is one exception which occurs in the word *Ralph*. The final consonant Brenda gives is [š]. It is interesting that here, as in the case of the [t^h]/[k^h] variation mentioned above, when Brenda does not have the necessary contrast in her system to reflect the adult contrast, what she changes is the point of articulation. In the case of adult [č] she retains the feature [-continuant] and varies on either side of the point of articulation. In the case of adult [f] she uses her one fricative [š], even though it has a different point of articulation, i.e. she retains the feature [+continuant].

The fricative [ð] occurs only once. It should be noted that in her parents' speech [ð] varies with [d]. This variation is along an English: Hawaiian-English scale.

III.7.4 Glides, [r], [h], and [ʔ] in BRENDA II, tape (071)

[w] and [y] are quite rare in this session. [w], however, seems to be quite well established. It is used in two words, *wowow* (Brenda's word for *dog*) and *walk*. [y] on the other hand only occurs twice, in [peyɛn] *pen* and [yut^hu] *you too*.

Just what the status of [r] might be is hard to say. In most cases it is probably best to consider this symbol to represent retroflexion of a vowel as in [brɛndə]. However, in one spontaneous instance only, *Ralph*, it represents a consonantal segment. It also occurs in the imitated *write*. In positions where Brenda's parents have a final [r] in variation with [Ø] Brenda in (071) has no final [r]. However [ʔ], [o] and [u] are found in that position, e.g. [gɔdəʔ] *corder* ("tape recorder"), [t^hek^ho] *Checkers*, and [bæu] *bear*.

[h] is found in initial position with one exception. In one case it varied with [ʔ] in final position.

Determination of the status of the glottal stop [ʔ] is quite difficult. It is found to vary with [p] (e.g. [t^{h}eipči]~[t^{h}eiʔči] tape) and with [∅] (e.g. [mami]~[mamiʔ] mommy). It also is found in places where the adult has [t] (e.g. cut, hat), [r] (e.g. corder) and [∅] (e.g. [šiʔ] see). In the cases where the glottal stop varies with another stop it appears to be Brenda's first or most natural attempt at the adult stop. However, in the cases where the adult language has no stop and yet Brenda has [ʔ], do we want to say that it is her "word boundary"? The later discussion of intonation may make this somewhat clearer (IV.3, p. 93). What may be the most plausible explanation is that Brenda is attempting to control the length of voicing. To do this she uses a glottal closure rather than a more gradual relaxation of voicing. In that case it would, in fact, represent word boundary on the surface which in some cases is neutralized with zero.

III.7.5 Vowels in BRENDA II, tape (071)

If the consonants are unclear in many respects, the vowels are even less clear. It seems as if Brenda uses the following vowels systematically: [i], [ɪ], [e], [ɛ], [æ], [a], [u], and [o]. She also has the diphthongs [ei], [əi] and [əu]. The front/back distinction is quite clear. We have [šiʔ] for horsie and [šu] (or [šuʔ]) for shoe. Other distinctions are not as clear. Particularly there is the problem of vowel height in the front vowels. In one case, 284 through 294, Brenda says *daddy* eleven times. It varies from [didiʔ], which occurs once, to [dædi], which occurs five times. [dedi] also occurs five times. On the basis of this case we would want to say that there was no contrast. However in most other cases the vowel height seems to be more consistent.

Here as in the phonology discussed earlier the solution lies in saying that only a broad distinction can be claimed, but within that broader distinction Brenda approximates what will later become narrower distinctions. In that case we would say that Brenda has at this time a contrast between front and back vowels, and a three-way distinction in height--that is, the basic five vowel system *a*, *e*, *i*, *o*, and *u*.

III.7.6 Utterances not Included in this Description

The data that have been considered here represent about forty-five percent of the total utterances found on the tape. It should be remembered from Table 4 that around fifty-five percent of the utterances were unintelligible. Because of the impossibility of determining the meaning of these other utterances we can not know to what extent they are still within Brenda's phonological system. However, we can say that this fifty-five percent is highly regular in phonetic shape. Much of this percentage is made up of utterances of the sort mentioned above (p. 58, 59); that is, not full words but those utterances leading up to an intelligible word. We can see in retrospect that although these are not to be considered words themselves, they are in some way part of the production of the words under study.

Among the remaining utterances there are a few segments and one cluster that are not found elsewhere: [z], [ž], [dz], [ndz], [mb], [x], [t^w], and the cluster [ŋd]. However, these each occur only once, and because of their rarity it does not seem plausible that they form part of any regular system. On the whole the utterances of the fifty-five percent unintelligible data do not go outside the system outlined above for the intelligible utterances. This gives reason to believe that, although based on a small portion of Brenda's total output, it is at least fairly representative of her system.

III.7.7 Summary of the First Session (071) BRENDA II

This study will always remain incomplete because of the inaccessibility of further data for testing hypotheses. However, we can say in general that the stops, including nasals, show quite a similarity to the adult system. Also we have seen the beginnings of word final consonants. Notice that those finals of the adult system that are used by Brenda are the final segments which correspond to the best established initial segments in her own system. These changes in Brenda's system indicate considerable development over the final system of BRENDA I.

III.8 BRENDA II, Eighth Session (141) age 1;8.21

In session eight (141) eight weeks later Brenda used 71 words (types). They can be broken into the same four categories as before:

(1) 32 spontaneous words which had been used in more than one session.

(2) 27 spontaneous words which occur in only this session.

(3) 2 modeled words which occurred previously. (Note that one of these, Suzie, was only modeled previously--it never occurred spontaneously.)

(4) 10 words which were modeled in this session only.

It should be mentioned that these four groups represent around eighty-five percent of Brenda's total output--a much higher degree of intelligibility than in the first session (071) of BRENDA II.

III.8.1 Spontaneous Compared with Modeled Words

In Table 6 a list is given of the words of (141). Both a spontaneous form and a modeled form is given in some cases. It is frequently the case that after Brenda says a word some other speaker will repeat it. Brenda will then say the word again. In some of these cases (but not all) there is a marked difference between the form as Brenda says it spontaneously and the form when she has a model. An example is the word hiding. The full sequence is as follows:

(141) 2 haidi:
(R) Hide? What's hiding?
3 brũ:
Oh the balloon? Where? Where is it?
Where is it?
4 haidĩŋ
Where?
5 haidĩ
The balloon?
6 haidih
7 haidi:
8 haidi:
9 haidʸi:

Brenda says hiding spontansously as [haidi:]. After I model the word she adds the final [ŋ], i.e. [haidĩŋ]. Notice then that in successive repetitions her form finally predominates again, i.e. [haidiː]. For this reason a form was taken to represent the spontaneous form if there was no adult model within the previous five minutes. This type of change will be taken up again in more detail later in the discussion of imitation (Chapter V).

III.8.2 The Effect of Construction on Phonology

In 121 through 123 Brenda says head [hɛt^h]. I then say, "Poor Brenda. Poor Brenda bumped her head. It hurt?" She then says bump.head., i.e. [bəmp.hɛ]. The question then is why does Brenda delete the final consonant in head? At this session Brenda normally has a devoiced consonant in this position. It seems that because of the increased complexity of trying to make the longer imitation, i.e., of the words bumped her head, the phonological complexity of what she says must be reduced.

One further example which may also be of this type can be seen in 158 and 159. Brenda says, read.page. ([rit^h.peč]). As will be seen in the discussion of stops for session (141) Brenda always contrasts [b] and [p^h] in initial position. It is difficult to explain why in this case the aspiration is deleted unless, again, because of the higher complexity of this attempt at a two word construction (vertical construction) the phonological contrast is not maintained.[1]

These examples are mentioned here to demonstrate that a discussion of phonology even at this quite rudimentary level can not be isolated from other elements of the theory. This interaction between phonology and construction is significant, not only for construction but for phonology.

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[1] See VII.1 where this point is discussed again, p. 144.

III.8.3 Stops in BRENDA II, tape (141)

Since the stops were already fairly well developed in (071) not too much change is evident here. The several inconsistencies in (071) have virtually disappeared. With three exceptions, voiceless stops are aspirated. One of these has been mentioned in III.8.2 as being affected by the longer construction within which it occurs. A second ca(mera) i.e. [kæ] is unexplained. The third exception will be discussed under clusters. Otherwise stops maintain a three-way distinction for point of articulation: labial, alveolar, and velar; and a two-way distinction between voiced on the one hand and aspirated on the other in all positions except final position. As in (071) all final stops are voiceless, with the aspirated and non-aspirated forms in free variation.

III.8.4 Nasals in BRENDA II, tape (141)

Nasals are much the same as in the adult system. There are several interesting occasions in which [ŋ] in the final position (-ing) is either deleted or replaced by the glottal stop [ʔ]. In both cases the preceding vowel is nasalized. In one case where the adult has [ŋk], i.e. pink, Brenda has [pʰĩʔ].

III.8.5 Fricatives and Affricates in BRENDA II, tape (141)

Brenda used the fricatives [š], [h], [f] and once [v]. She used the affricates [č] and [ǰ]. The places in which they are used are interesting in reference to the adult system. In the first place there is no voicing contrast in final position except in the one case of the word *give*. Brenda says:

(141)108 gɪɛuf
109 gɪɛv
110 gɪv

That is, with persistence in one case she succeeded in making the voicing distinction in final position.

In initial position Brenda used [š] in words such as *self*, *something* and *say*. In the word *Charlotte*, however, she uses [h], i.e. [halɛt]. In other cases, e.g. *hiding* she uses [h] where expected. [f] is used where it is normally found in adult English; however, in one instance she replaces it with [p^h], i.e. *finger*. It is interesting to note that this is in the case of a vertical construction[1], *finger.touch.*

In final position [š] varies with [s] where the adult has the cluster [st]. [š] is used where the adult has [z], e.g. *owls* and *please*.

The only occurrence of [ǰ] is in variation with [č] in the word *triangle*, and this only in imitation of an adult. Otherwise [d] is found in places where the adult has [ǰ], e.g. [duši] *juice*. [č] is found word final in *page* as well as in place of [ks] in *pixie*.

In general, then, it can be said that since (071) Brenda has added [f] and [č] to her system. It is interesting that in (071) we saw an example of [t^h] and [k^h] varying where one would expect [č]. That is, she was maintaining the feature [-continuant] and varying the point of articulation. Now in the case of the cluster [ks] she uses her one affricate [č] which happens to be at the point of articulation between the two elements of the cluster.

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[1] See VII.3, p.151, for definitions of types of vertical construction.

III.8.6 Liquids and Glides in BRENDA II, tape (141)

Liquids and glides are the least fully developed of the consonants in (141). In initial position there is no contrast between [r] and [l], e.g. *lost* [rwɔs], *read* [rit^{h}]. In one case the initial [l] is replaced first by [w] and then by [y] in the word *lantern*.

In medial position the glide [w] replaces both [l] and [r], e.g. *rolling* [roĩŋ]~[rowĩŋ] and *carry* [k^{h}æwri]. The symbol [wr] represents in this case a segment neither clearly liquid nor glide. Notice in the case of *rolling* that the first attempt has nothing in the place of the medial liquid, and the second attempt includes [w]. This seems to be an indication of some natural restriction on production that with repeated effort Brenda can lift to some extent.

The liquid [l][1] when it appears before another consonant as in *self*, *milk*, or in the case of the syllabic [l̩] in *triangle*, is replaced by the vowel [u] or [o]. In the case of [r] the syllabic [r̩] as in *Peter* becomes [o], i.e. [p^{h}ido]. When [r] precedes another consonant there is variation. In *lantern* we find [yɛntɪn], but *turn* is rendered as [t^{h}un]. *Hurt* is [hərt].

One glide [w] is well established in positions where it is expected from the adult system. However, because of its use in

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[1] The status of the liquids in this position is difficult to determine because of variation in the parents' speech on a Standard English - Hawaiian English scale in the case of the father and a Standard English-Japanese English scale in the case of the mother.

Brenda's system in places where the adult has the liquids *l* and *r*, its status in Brenda's system considered independently of the adult system is difficult to determine.

III.8.7 Clusters in BRENDA II, tape (141)

Clusters with liquids have been mentioned above when the liquid precedes the other consonant. There are a number of cases of consonants followed by liquids. The most common is [br] which, perhaps because it appears so frequently in Brenda's name, is very well established. The cluster [b^{w}] appears in *black* and in *balloon* in imitation. [pi] does not occur. In the word *please* we find [p^{h}]. *Fly* is pronounced with either [f^{w}] of [f]. The clusters [ps] and [ks] both occur as the only examples of clusters that correspond exactly to adult clusters in the words *oops* and *pixie*, respectively.

One exception referred to in the discussion of stops (III.8.3, p. 72) has been left until now since it is part of an interesting set of contrasts when compared with the adult system. It is somewhat commonplace to say that the child will represent the adult [t^{h}] as [t^{h}] and the adult [st] as [t]. In this session Brenda was kind enough to say *tape.step.* [t^{h}ei.tɛʔ] and give us a real example of this contrast. *Toe*, *touch* and *turn* all have initial [t^{h}] which indicates control over this segment. However, for *stuck* she gives [t^{y}ʌk] on one occasion and [t^{h}ʌk^{h}] on another. That is to say, Brenda appears to be making a further distinction. She seems to be making a three-way contrast between [t^{h}], [t] and [t^{y}]. If phonetic conditioning were taken to be the explanation, one would not expect [ʌ] to cause palatalization in [t^{y}ʌk] while [ə] in touch [t^{h}əč] does not.

This contrast will be returned to in the discussion of the intervening sessions. For now it is better to focus on a second phenomenon. In the word lost we see [rəš] and [rwɔs]. That is to say, in final position it is not the case at all that adult [st] is replaced by [t]. It is replaced rather by [š]~[s]. It should be pointed out that in the parents' speech [st]~[s] in final position.

III.8.8 Vowels in BRENDA II, tape (141)

Since this does not pretend to be a full phonological analysis of (141) it will be sufficient to say that the vowels by this stage of Brenda's development are very much like the vowels in the adult system. There is an additional source of vowels in Brenda's system in the places where vowels are altered to represent liquids in the adult system. We have already seen what may be examples of this, such as in turn [t^{h}un], and Peter [p^{h}ido]. Again, it must be noted that while these developments have been observed for the acquisition of Standard English (e.g. Edwards, 1973), similar processes are occurring in variation between Standard English and Hawaiian English.

III.8.9 Conclusion to BRENDA II, Eighth Session (141)

As this study has progressed and Brenda's linguistic ability has developed, the inadequacy of the half hour session becomes more apparent. With a vocabulary the size of Brenda's it becomes more difficult to be sure that what occurs spontaneously in one half hour represents the full extent of her system. It is for this reason, plus the fact that this study is not primarily a study of phonology, that this section on phonology has been restricted to these quite general notes and examples. We can see, however, that Brenda's system has developed to a point of high intelligibility to adults. Vowels, stops, nasals, the fricatives [š], [h] and [f] are very similar to those in the adult system. The liquids and affricates remain to be developed. The liquids at this stage have only begun to appear in initial position. In other positions they show up in their effect on the vowels.

III.9 Intervening Sessions (081 - 131), age 1;7.9 - 1;8.17

Since the data of (141) have been somewhat inconclusive, it will help to look back at several things that appear in the earlier sessions. First we can look further into the problem of the reduction of initial clusters.

Table 10 gives nine words which appear throughout the eight sessions. Notice the word tape always has [t^h] except in (121) where [t^h], [t^y] and [t] all occur. For that same session tall occurs without aspiration, toe with aspiration. The initial of two is the palatalized [t^y]. The palatalization of the stop in two is not problematic because of the following vowel. (Note: [t] varies with [t^y] in (081), [t^h] with [t^y] in (111), and [t^y] with [ǰ] in (131)). But in this session (121) stuck has [t^h], [č] and [t] as the initial consonant. That is to say, it is only in the last session (141) that the three-way contrast suggested in III.8.7, p. 75 between [t^h], [t] and [t^y] occurs.

In the development of the word *step* we can see some of the same alternation. First we see in (101) that [t^h] varies with [č]. In the next session in which it occurs (131), it occurs both aspirated and unaspirated. It is only in (141) that it occurs only unaspirated.

In summary of Table 10, we can see that this contrast between aspirated and unaspirated stops in the child's system to represent aspirated stops and a cluster respectively in the adult's system is not clear at any stage of BRENDA II. By tape (141) it seems to have reached a certain amount of stability, but it is apparently still in the process of development.

A second thing which can be seen by a look at the earlier data are several instances of word final voiced consonants. In (141) it was said that this contrast did not exist; yet one week earlier *bug* and *big* occurred with voiced finals. Two weeks earlier *good* appeared as [gudu].

In general these isolated pieces of data give evidence that it is virtually impossible to consider the child's developing system either whole or entirely consistent at any one time. What we see instead is a generally valid consistency with notable exceptions.

Finally one rather difficult sequence from (091) should be considered. Brenda is drawing pictures with Charlotte. Charlotte draws a picture of a girl with long legs and large polka dots on her dress. First Brenda says *tall* [t^hɔ] threa times, then *Brenda*. She then stands up and stretches up on her tip-toes and says *tall clown*. But it was not as direct as that. What she really said is this:

(091)81 tʰɔ
82 tʰə
83 tʰæʔ
84 kʰæʔ
85 kʰəãũ
86 kʰə̃ãũ

Utterance 81 is clearly tall on the basis of her phonology at that time and on the basis of other productions of the word with which this was identical.[1] 86 was clearly clown on the basis of her other productions of that word. What were 82 through 85? It appears that Brenda has a mental representation of both words, but for some reason when they are in sequence one interferes with the other. She seems to go from tall to clown by a succession of alterations of one element at a time. She changes the vowel, adds the glottal stop, assimilates the [tʰ] to the glottal stop, and then changes the vowel and drops the glottal stop when she nasalizes the final vowels. Hockett (1967) has called words of this type in adult speech "blends". He points to their importance as a means of elucidating general design features of language. Hockett feels that it is "possible to think of a language as a system whose design is reflected not only by the utterances produced by its speakers but also by the process of production itself" (p. 911). In this case it certainly appears that one word is in some way interfering with the other, and I feel that it is inadequate to describe this as simply a "performance error". That is, I agree with Hockett that we can learn something about what language is by seeing how it works. In this case it looks as if these words are in a vertical construction (i.e. ball.clown.)[1] that causes the phonetic confusion. There is an interaction between constructional complexity and phonological complexity so that words which are easily pronounced separately become somewhat more difficult in construction.

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[1] This form [tʰɔ] would also be an acceptable pronunciation in adult Hawaiian English.

III.10 Conclusion to Phonology Study

We have seen several examples of Brenda's successive improvement of a word. For example in (071) there was the case of shoe being carefully worked on in whisper before a loud attempt was made. In (141) we saw the case of give [giɛuf.giɛv.gɪv] where in three successive attempts the word gets closer to the adult surface form. This represents the case where Brenda is apparently aware of some target form and can actually improve her production with practice and without further help from others.

On the other hand we have seen cases where although Brenda's spontaneous form is intelligible to adults, it improves when she has a model. An example of this improvement is hiding from (141) above (III.8.1, p. 70). With a model it is [haidĩŋ], but then as she repeats it drifts back to her original form, first [haidĩ] and then [haidi:]. This is evidence for the opposite process to that just mentioned above. That is, when Brenda has an immediate model she can produce a form closer to the adult form but apparently as the memory wanes so does the ability to produce. These two processes seem to establish a central level of production that represents Brenda's target surface form. With repetition she can improve it, and with imitation improve it considerably more.

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[1] See VII.3, p. 151.

There is good evidence that Brenda can remember forms well beyond her ability to produce them. An example is that of microphone which I rehearsed with her in tape (141). She was able to say [məikrə̃ʔə̃], [məik^{y}u] and [məik^{y}o] only after my careful (and this one time insistent) pronunciation. Two months later she said [məik^{y}əfon] quite spontaneously as I got out my tape recorder and microphone.

There is evidence, then, for two processes: one process allows Brenda's surface forms to improve as her system develops even in the absence of hearing the adult form repeated: the second process allows Brenda's surface forms to improve when there is an immediate model in the speech environment. Hsieh (1972), in his study of the acquisition of Taiwanese, has argued for the need of listing surface forms in the lexicon. A model of the sort he has proposed would account for both processes since the surface form would account for such developments as in the microphone example and the deep form would account for the consistency of forms such as [haidi:]. Hsieh has not developed his theory specifically to deal with problems of this kind, so to adapt it in this way is somewhat speculative.

Stampe (1969) and Smith (1973) have both proposed that the child deep representation is in fact the adult surface form, but in production this form is subject to natural phonological limitations--Smith's "realization" or "incompetence" rules. I feel that the results of this study are in accordance with these proposals; that is, that the child has continual access to adult surface forms through memory. In contrast, however, to Stampe and Smith, I suggest, as Hsieh has implied, that the child also continually constructs his own deep representations and that it is from these deep representations that he speaks.

This same problem approached from a slightly different angle is that of sound change. Kiparsky (1968a, p. 175) says:

> The transmission of language is discontinuous, and a language is recreated by each child on the basis of the speech data it hears. Nor should the term restructuring be understood as denoting a change of some speaker's grammar into another grammar, for it refers just to a discontinuous linguistic change arising from the difference between the grammar constructed by a child and the grammar of those whose speech constituted his linguistic experience.

That is, an adult's grammar is rigid and changeless, and apparently the child's grammar is equally rigid and changeless--just different from the adult's. It is hard to see where the change can take place in this type of system.

Postal (1968) takes a more flexible position. In his system sound changes take place both by addition of rules to the adult's phonological system and by reformulation by children to achieve an optimal grammar.

By Kiparsky (1968b) the rigid position taken previously is somewhat softened, as demonstrated by the abstractness question. By 1971 Kiparsky takes the position that at least in some cases the "stupid solution", that is surface forms being listed separately, is the better solution to the question of variation.

The position I take here is that for both historical and developmental reasons the child's system must be seen to be in flux. It must be seen to develop on the basis of an awareness of the adult surface forms and a continual evolution of the child's own deep representations which are the product of the adult forms and the child's natural restrictions. The question of whether or not the developing system must ever be supposed to stop evolving must be left to another much fuller study.

Following the model suggested by Stampe and Smith I propose that Brenda has a mental representation that corresponds to the adult surface form of a word. Her productions are attempts to match that form restricted by natural limitations which with development are successively lifted. This would explain the fact that Brenda can remember microphone even when she cannot pronounce it until some time later when she can pronounce it.

This model, however, does not account for the case of imitations where with an immediate model in the adult speech these natural limitations are temporarily lifted. This would imply that there is in fact some difference in levels of mental representation as Hsieh has suggested. One mental representation is the same as the adult surface form, but apparently Brenda has a separate underlying form that is not the same as the adult form. Rather, it is her own construction on the basis of her own surface form. In a model of this sort, then, we could explain how, with an immediate model of a word present, Brenda would simply imitate whatever is within the current limits of her productive system. When the model is not present, what Brenda would say is her own form. In certain cases she would also try to expand her own deep forms, and to do this she would have to say the word over and over again--at each step comparing her new surface form with the mental representation of the adult form on the one hand and with her own deep form on the other. This type of model would account for the three types of words found in BRENDA II; (1) words which are used spontaneously with relatively little variation, (2) words that are built up over a string of false starts, and (3) words that are imitated and show phonological characteristics in advance of the current spontaneous system.

Once again the conclusion is that Brenda's system can be seen to have elements that are systematic within a current system and other elements that suggest or approximate a later system. I can only agree with Hass (1972, p. 46) that

> children do not clean up one aspect of their phonology or one part of their grammar before going on to another. What is involved is a process of sorting out everything in one giant, systematic approach to wherever they are in language at that time.

This brings to an end the discussion of Brenda's phonology as such. In the tapes of BRENDA III and IV the degree of intelligibility is high enough that I feel I am doing no serious injustice to use exclusively a gloss or translation of her utterances. As for the phonology of BRENDA I and II, I feel that I have made clear the central point that within Brenda's phonological system at any one time are strong indications of the stages to follow. And finally, the reader should have an adequate "feel" of Brenda's phonology at BRENDA II to understand references to it in later discussions.

CHAPTER IV

Intonation

IV.1 Why Make a Special Study of Intonation?

Bever, Fodor, and Weksel (1965, 1971, p. 275) have stated that "it is widely accepted in the literature that the child effectively masters the intonation pattern of his language *before he has learned any words at all.*" Miller and Ervin (1964, 1971) have noticed the use of stress to mark a distinction between a locative construction (e.g. *baby róom.*) and a possessive construction (e.g. *báby book.*) Brown and Bellugi-Klima (1964, 1971) have pointed out that it is on the basis of primary stress and terminal intonation contour that utterances are separated into sentences (horizontal constructions) and sequences of separate utterances (vertical constructions). When I began this study I felt it would be interesting to look for any development of the child's ability to control prosodic features in the period before sentence construction.

IV.1.1 Transcription of Intonation

As I mentioned before (II.2.2.3, p. 20) the first transcriptions of intonation in Brenda's speech were made in musical notation. After a time a set of more or less regular patterns began to emerge and this notation became unwieldy. I noticed that all of the utterances fell into four basic groups. The first, to which I assigned the symbol "F" (for "falling") was characterized by a falling intonation. These utterances began on a pitch and then fell a distance of at least a minor third--usually more than that. A second group, L, were level.

Although there was a certain amount of variation in pitch it was very small and there was rarely any difficulty in distinguishing those which dropped slightly from those that dropped enough to be classed as falling (F). A third category, R, rose in pitch--again noticeably, i.e., more than a minor third. A fourth category, C, represented all the rest which showed a complex contour that was not a simple movement in one direction.

A second level of transcription of intonation was added, although later it did not seem to have any particular importance. The original four symbols, F, L, R and C, were altered to FL, LL, RL, and CL to indicate an unusual length (L). I found, however, that since length was already being marked on the vowels in the transcription, this marking was really redundant and added nothing important.

After two sessions of transcription with the eight symbols (F, FL, L, LL, R, RL, C, CL) another interesting thing was noticed. In the F group there appeared to be really two quite different types. The first of these as described above fell from some pitch to some other pitch at least a minor third below. In the second type the fall was a longer fall and no final pitch could be determined; that is, the pitch and volume fell away at the same time. These were then transcribed FX--the X representing an "x" placed on the musical staff to indicate no definite final pitch could be determined. Since the earlier tapes had not included this distinction I had to retranscribe all of the F's to determine the extent of this special type.

IV.1.2 A Statistical Summary of Intonation Types in BRENDA I, age 1;0.2 to 1;1.22

In Table 11 all of the utterances of BRENDA I are summarized by intonation type. Since there was a steady increase in the number of utterances from session to session, the raw figures have been given; below these figures the percentages for each type are given. It should be understood that no attempt has been made to perform any statistical operations on these figures. It is not suggested that they may or may not be statistically significant. They are presented here as the clearest way to represent the growth of one particular class of intonation type.

The percentages are listed by the following five groups:

(1) F percent of the total. This figure represents all F's including the special FX type.

(2) L percent of the total.

(3) F + L percent of the total.

(4) FX percent of the total. The purpose of this percentage is to show the relative importance of this group in the whole corpus.

(5) FX percent of the F group. This figure shows the growing place of this special type within all the F group.

If we look at the percentages listed for each of these five groups an interesting development shows up. First, in looking at (1) F percent of total, we can see that this falling contour, although important in the earliest sessions, grows by (051) to more than three-fourths of the total utterances. Notice the decreases in (021) and (041). In (021) Brenda was sick and was not responsive in general.

Her most typical utterance that session was a long string of velar nasals interspersed with whining. Notice also the low total number of utterances. Session (041) is unusual in a number of ways. There were quite a few (64 altogether) utterances that were difficult to transcribe. They were mostly nasalized schwa [ə̃] and occurred just before other utterances. It was difficult to decide just how to treat these. Since they did not show up in the next session they were left in abeyance as something so far inexplicable.

The second group (2) first grows somewhat and then decreases in importance. However the third group (3) shows that between the two types F and L most of the distribution is taken up--94.5 percent of the total in (051). It is clear that these two groups will include most of Brenda's speech at this time.

The fourth and fifth groups (4) and (5) show that the FX type of utterance has grown to be more than half the total of Brenda's utterances and that among the falling (F) types most of those are FX.

IV.1.3 Primary Stress and Terminal Contour

It should be clear that the intonation type that I have transcribed as FX corresponds exactly to English primary stress and terminal contour. This set of statistics has provided an interesting fact. From these data it can be seen that primary stress and terminal contour are the products of development. Lieberman (1967) and Painter (1971) have claimed that this FX is the natural product of the process of vocalization. To activate the vocal chords the sub-glottal pressure rises, vocalization takes place, and then as the sub-glottal pressure drops off the pitch falls and the volume falls to nothing. This quite accurately describes the FX intonation contour. What remains to be explained is why this process develops over time if it is a natural process of vocalization. Shouldn't we expect this contour to be found first and then later to find levels, rises, and so on? It is true that in the first session there were falling pitches present in large enough number to indicate some preference for this type. What seems most plausible is that in the early stages Brenda's control over voicing and sub-glottal pressure is incomplete. The result of this incomplete control is that in some cases she actually over-extends the period of sub-glottal pressure which results in level intonation. Geoffrey Nathan[1] has suggested that intonation contours are, in fact, controlled before this period but that the complexity of developments in phonology result in a regression of intonation to an earlier stage. I think that this is undoubtedly the correct explanation but a clear description will have to await studies of children at even earlier stages of vocalization than this.

A question raised by the variation between F and L contours is whether there is any predictability about falling (F) and level (L) on the basis of syllable structure or context. Table 12 gives a list of Brenda's eight words in session (051) along with the intonation contours for each. Notice that with one exception Brenda's words at this time are characterized by FX or F. That is to say, when she says a word that is recognizeable she gives it primary stress and terminal contour. The one exception is interesting. The word e is pronounced level nine out of ten times. This word may be recognized as equivalent to the Japanese e, i.e. yes. This is one of the few words of Japanese the mother uses regularly with Brenda and it is not surprising that it has become part of Brenda's speech. What is interesting in this context is that this word is not treated by Brenda in the same way as the others. It does not receive the same stress and intonation. These results seem to indicate that Brenda has learned English primary stress by (051) and also learned that it is English and where not to apply it. Of course, this is an important claim and should be investigated with further studies of truly bilingual children.

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[1] Personal communication, December 1973.

Having said this much about the two categories F and FX, it is fair to ask if any distinction can be found to exist between these two types. As far as I can determine from the data of (051) there is, in fact, no distinction in use between these two types. It should be noted here that for the Hawaiian English of Brenda's father the question intonation, at least for direct questions with yes/no answers, is a fall from a high pitch to a lower pitch. Vanderslice and Pierson (1967) give a full discussion of this intonation. For example, they give (p. 162) you brought milk? in which you is high pitch, brought at a still higher pitch and milk has the lowest pitch. In a longer question the high pitch is maintained throughout with a low pitch only on the final syllable. For Brenda's parents, particularly the father, this question intonation varies with the Standard English rising intonation. In (051) there is no evidence that either the F or the R are used for questions by Brenda. A large number of Brenda's utterances are responses to the mother's (or my) questions, and so the most appropriate response is the declarative intonation.

IV.1.4 Stress in Bisyllabic Words

In the discussion above no distinction has been made between monosyllabic words and bisyllabic words. It could be questioned whether or not there is any systematic placement of stress on one or the other of the syllables in words of two syllables. The list below gives some examples.

(051)6 néne
9 nené

28 ǽwəu
29 awə́u

47 dedí
48 dædí
49 dædí
50 dǽdi
51 dedí
52 dǽdi

172 áwə
173 awə́

As can be seen from these few examples there appears to be no regularity in the placement of stress. It might be suggested that there is a relationship between stress and vowel quality from examples 28 and 29 above, with [æ] receiving stress. However the following examples indicate that this is not the case.

(051)53 ǽlə
54 ælə́

The repetition of the same word <dædi> but with different stress, rules out a differential application of stress based on semantic intent.

IV.1.5 Developments after (051) in BRENDA I

The data given above have covered the period from (012) age 1;0.2 to (051) 1;1.22 because in many ways this period is more homogeneous than if it were to be extended to (061) or (S11). As I showed in the discussion of phonology, Brenda's system by (051) was already in the process of change. In the later several tapes the change becomes considerable. The list below gives the intonation figures for (S11) which is four weeks after (051).

(1)	F percent of total	50.5
(2)	L percent of total	33.1
(3)	F + L percent of total	83.6
(4)	FX percent of total	15.6
(5)	FX percent of F	29.4

Notice that the category FX shows a decrease within F as well as F showing an overall decrease. The level (L) group has increased in importance. There is also one new minor development. Some of these utterances (seven out of 275) fell, then rose slightly as the pitch was released. These two developments are indications that Brenda was actively trying to control the final timing of the release with the dropping of sub-glottal pressure.

IV.1.6 Conclusion to BRENDA I Intonation

During the period of BRENDA I, Brenda has developed English primary stress and terminal contour up to a peak at (051). As her phonology begins to become elaborated she enters a period in which she has to readjust her timing to account for new phonological conditions. Stress and intonation contour can be seen to develop to a certain extent independent of segmental phonology.

IV.2 Intonation Statistics for BRENDA II, age 1;7.2 to 1;8.21

As in the case of BRENDA I, I transcribed all the utterances of BRENDA II for intonation by use of the symbols described above (IV.1.1, p. 85). Table 13 gives a summary of these figures for BRENDA II. It should be remembered that at the end of BRENDA I the category of F (falling) had become central in Brenda's system. I suggested that this represents the basic stress pattern of English. In light of that it is interesting to notice that overall the F category has fallen in use (46.7 percent for the total period) and the L category has risen (42.2 percent for the total period). The sum of the two figures is still, however, very high--that is, 88.9 percent of the total of Brenda's output falls into these two categories. It is clear that the discussion of intonation in BRENDA II will have to explain these figures.

IV.3 Interpretation of Table 13

The first question that must be answered is: if the F category represents primary stress and final contour, why the emergence of the L category? The explanation may be related to the fact that during this period Brenda is in the process of acquiring word final consonants. These final consonants have the effect of keeping the level of phonation up until the consonant produces the stop.

A look at the relation between the L contour and the phonetic shape of words in BRENDA II confirms this hypothesis. The following four rules cover the large majority of cases found:

(1) Words of the shape CV are F (falling)

(2) Words of the shape CVCV are F (falling)

(3) Words of the shape CVC are L (level)

(4) Words of the shape CVN[1] are L (level)

Both the F and the L intonation are in fact primary stress. What is distinguished is the effect of the final consonant. Notice the case of rules (3) and (4) above. There is apparently some similarity between the nasal stop [n] and other voiceless stops. The word *Ron* occurred in (111) as [rãtʰ]. By (141) it was [ran].

IV.3.1 Development of Intonation by (141)

By the time of (141) Brenda had begun to gain control of the final consonants. For this session the four rules above have to be given with exceptions. (1) and (2) remain the same. (3) holds but with the exceptions of the words *hurt*, *milk*, *step*, *read*, and *give*. That is to say in some cases, but not all, Brenda is able to produce words of the shape CVC with primary stress and falling contour.

Rule (4) needs some elaboration. A distinction must be made between [n] and [m]. From early in BRENDA II words ending in [m] were falling; that is, [m] was not equivalent to the group of voiceless stops. In places where [n] was expected on the basis of adult forms

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[1] N represents any nasal segment.

Brenda treated it the same as a voiceless stop originally. By (141), however, she gave several words ending in [n] the F contour. In several cases (i.e., Ron and turn) there was no consistency with some instances being F and some L.

IV.3.2 Stress of Syllables

In BRENDA I I pointed out that no significance could be ascribed to the placement of stress on either syllable of a bisyllabic word. By (071) this placement has become highly consistent. Stress is placed on the penultimate syllable. For example there are báby, Brénda, dáddy, mómmy, mónster, and páper. But also notice hot wáter [haʔwádə] which may be a tri-syllabic word for Brenda.[1] Also notice what may or may not be one word in (131)148 no fáir. There is only one regular exception to this general rule. In (131) Brenda inexplicably stresses the second syllable of ready [rɛdí] in about half of the instances in which she uses the word. The explanation for this may be that in children's games, such as hide-and-seek, the searcher often announces the beginning of the search by calling out [rɛ̀:dí:](ready?). Otherwise any placement of stress on the final syllable appears to be accidental.

A related phenomenon is Brenda's choice of syllable when her word is a reduced form of a longer adult word. For example in (071) Brenda uses [šiʔ] for horsie. However, by the next week, in spite of the 14 tokens of [šiʔ] in (071), she has shifted to [haš]. This is apparently more consistent with what is a general practice of using the stressed syllable of the adult word as she does, for example, in *cucumber* [$k^y uk^h$]. A further consideration is that this form for *horsie* is homophonous with her form in (071) for *see* [šiʔ]. The shift to [haš], of course, eliminates the homophony.

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[1] See VII.2, p. 148, for discussion of this form.

The only word in the corpus in which the adult word has final stress (*balloon*) Brenda gives as [brūː]. In this case she has kept the initial consonant and the final syllable.

IV.4 Prosodic Variation and Semantic Contrast

Brown (1973) raises the question of whether or not the variation in intonation patterns in the one-word period indicates semantic contrast. He quotes Bloom (1973) as saying that prosodic patterns do "not seem to be used for semantic contrast prior to the onset of syntax" (p. 153). He further reports the Menyuk and Bernholz (1969) research in which they have claimed the opposite results, i.e., prosodic features have been used to indicate (1) statement, (2) question, and (3) emphasis. My data agree with Bloom's conclusion. Although there is considerable variation, most of it can be predicted on the basis of syllable structure and phonological content. There is apparently no semantic contrast. For example there is the following sequence from (141)--the end of the one-word period.

(141) 10 brɛndɛʔ F
11 brɛndə FX
12 brɛndəʔ R
13 brɛndə F
14 brɛndə F

For these utterances the context is unvarying and yet there is an R within this group.

As another example look at this group from (141).

(141)18	ran	F
19	rən	L
20	rən	C

Or:

(141)40	brɛndu	L
41	brɛndu	FX
42	brɛndə	L

Or:

(141)64	mami	FX
65	mami	C
66	mami	F

Or:

(141)76	ran	F
77	ran	R
78	rən	L

Without even considering the question of what any one of these intonation contours might mean, it is clear, I think, that the variation in these repetitions within a set context reduces the possibility of contrast. It is for this reason that I have treated the development of intonation statistically rather than looking at separate occurrences of specific patterns. I feel that only the statistical observation of the prominence of the falling contour is justified from my study.

IV.5 Conclusion to Intonation Study

By the end of BRENDA II, Brenda has learned that the basic stress in English is on the penultimate syllable. She has had to redevelop her control of terminal contour since the addition of final stops to her system had the effect of causing her to maintain level pitch. By (141), although Brenda's control of terminal contour is not complete, it is well on the way to becoming established. This calls into question the claim by Bever *et al.* (1965, 1971) that these prosodic features are controlled before learning any words. The solution is probably, as Nathan (personal communication) has suggested, that this apparent lack of control indicates an interaction in complexity between intonation and phonetic production. Since the terminal contour is one of the principle criteria by which other investigators such as Brown and Bellugi-Klima (1964, 1971) have been able to determine sentence construction it is not surprising that control of this contour should be fairly well developed long before the process of sentence construction actually begins.

CHAPTER V

Discourse Redundancies

V.1 Imitation and Repetition

I have been postponing discussion of two important aspects of Brenda's speech, imitation and repetition. Earlier I said that the consideration of phonology and intonation was a relatively context-free aspect of this study. This must be qualified now since in presenting the material I was obliged to refer to context in several ways. In the first case I had to use the context of an utterance as the only means of making a judgment to provide a translation or gloss. In discussing phonetic variation, I had to look at a sequence of utterances within a constant context as a means of making a judgment about sameness or difference. Finally, I had to separate imitation from spontaneous utterances as a means of getting at Brenda's productive system. This, of course, entailed a reference to the context to see if some other speaker had used the particular word under study.

I have now come to the place where these two concepts, imitation and repetition, can be seen to refer to two types of contexts of an utterance. In the first case, an imitated utterance is related to an earlier utterance of another speaker. In the second case, a repeated utterance is related to an earlier (immediately preceding) utterance of the same speaker, namely Brenda. Both are instances of the same general phenomenon of repetition. In this discussion, however, repetition will refer to the child's repetition of her own utterances.

I have coined the term "discourse redundancies" to refer to imitation and repetition because they seem to function as a means of introducing redundancy within the context of discourse. In my use of "discourse" I am not making a distinction between "discourse" (the connected utterances of one speaker) and "dialogue" (the connected utterances of separate speakers). I am using "discourse" to mean a series of related utterances of either a single or several speakers.[1]

V.1.1 Piaget's Play and Imitation

It is interesting to notice the similarity of the distinction between repetition and imitation in speech and that made by Jean Piaget in his treatment of play and imitation--or on the more general level, accommodation and assimilation. Piaget in many places, notably in his Play, Dreams, and Imitation in Childhood (1951), has argued that the process of cognitive development is a process of adaptation, the two poles of which represent the child's adaptation of his own structures to the world--accommodation--and the child's adaptation of the world to his own structures--assimilation.

In looking at Brenda's language development we see that these two types of adaptation have clear manifestations even at this very early stage. In her imitation of adult words we will see to what extent her own system can be altered to match that of the adult. In her repetitions we will see what are the limits of the internal structures of her own system. It is from this point of view, then, that I will be looking at discourse redundancies.

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[1] See VI.1, p. 125.

V.2 Imitation - How Can One Tell?

The idea that children learn their language by imitation has been both championed and argued against for some time. One very basic methodological problem is rarely mentioned in these discussions: how can you tell if a child has imitated something? What are the limits of what will be accepted as imitation? Obviously if the adult says doll and the child says [da] it is easy to claim that it was imitated. However, if the child said [arwaθʌz], as Brenda did in tape (012), most likely everyone would agree that this was not an imitation of doll. But why? Clearly there is a tacit agreement that to be considered an imitation an utterance and its model must be within some undefined limits of similarity as judged by the investigator. Otherwise all utterances following adult utterances (i.e. all utterances) would have to be considered imitations. In that case the argument that the child learns by imitation would be won *a priori*.

A second consideration is to determine somehow just what is being imitated. As in the case of [arwaθʌz] above, if it was said with a particularly even intonation it might perhaps be in imitation of the overall intonation contour of what the adult had said, even if every detail of the phonetic content were changed. In that case, it might have been a good imitation. Again, it is clear that some undefined assumptions are usually made about what is being imitated, and usually the model is taken to be the phonetic form.

From these points it should be clear that when a child's utterance is taken to be an imitation, it is because it is within some area of overlap with the hearer's system. There is apparently some extension of one's own system that can be made, so that although [da] is not the phonetic shape of the word *doll* it can be understood as translating to that.

One final difficulty in studying imitation arises even if one accepts an undefined limit of intelligibility. The question is: how long can a child wait to imitate before the word falls into the group considered spontaneously produced? Is the latency two seconds, two minutes, two days? Bowerman (1973, p. 21) has defined imitations as follows:

> A direct imitation was defined, as in the samples from Brown's subjects, as a complete or reduced rendition in the same word order, of another person's utterance which had occurred within the three utterances preceding the child's.

That is, Bowerman along with Brown tends to think that the imitation should be more or less immediate to be called an imitation. Bowerman does not mention, however, over what time period those preceding three utterances may extend. The utterance cited in the chapter on phonology (III.4, p. 56), (021)21 [čoda] is a good example of this problem. This word is problematic because there is no immediate instance of it in the input, so it is difficult to call it an imitation; yet it does not fit into what appears to be Brenda's productive system. An important consideration, then, in discussions of imitation is the latency of an imitation.

V.2.1 Spontaneous and Elicited Imitation

Table 14 lists a number of suspected imitations taken from each of the eight tapes (012) to (051). It is not unusual in these tapes of BRENDA I for the mother to prompt Brenda to say things. She is clearly trying to elicit imitations. The relative lack of success of this method is suggested by the items in Table 14. Out of the fifteen examples, eight (which are marked by an "E" following the example number) are elicited by an adult. The remaining seven utterances are spontaneous imitations (these are marked with "S").

Of the eight elicited imitations, all of them are cases of prompting by repeating a single word or stressing it in a slightly expanded version. For example in E11 an adult says, "Dropped. Did it drop?" The spontaneous imitations are similar. Four are imitations of the last word said (E1, E7, E10, E14). In the other cases the model is stressed. In E6 and E15 the model is stressed within a longer sentence. In E9 the phone is answered first by the father, then by the mother. The "hello" is given importance by position in initiating the phone conversation. The distinction between spontaneous and elicited imitations lies mainly in the other speakers intentions, not in Brenda's response.

What is important, then, is not so much whether or not the imitation is elicited, but rather the position of the word, or the stress it receives, or both. Of course, in the elicited cases the adult's prompting takes the form of duplicating conditions under which the child imitates spontaneously.

Note that these examples are few compared with the total corpus, and particularly when compared with the number of times that prompting apparently failed. It should not be taken as an indication that this is in any way the most common or significant portion of the data.

Perhaps it would be useful now to review the terms that have been introduced. In the discussion of phonology I made a distinction between a "modeled" utterance and a "spontaneous" utterance. A spontaneous utterance is one for which no model exists in the preceding recorded five minutes of the speech environment. "Modeled" is a neutral term which does not claim that the utterance is necessarily an imitation, but only that that possibility cannot be eliminated. It may or may not be an imitation. By an imitation I mean an utterance that can be clearly shown to be copied from another speaker. A "spontaneous imitation" is an utterance in which the child has not been specifically prompted for that word. An "elicited imitation" is one that has been specifically prompted. Unfortunately, these categories are easier to state quickly in this way than to determine in practice.. For instance, what is the length of time prior to an utterance that should be considered? If someone in another room or on another day "models" a word, should it be classed as "modeled"? Or is it only "modeled" if it is in the same discourse within a short time? In this case, as in the case of the glosses, I have had to make judgments which ultimately go back to my own intuitions. The discussion that follows shows the approach I have taken with these problems.

V.2.2 Latency of Imitation

The question of latency was raised above. In Table 14 some time measurements are given to indicate the lapse between the model and the child's utterance.[1] In all cases but five (E2, E8, E9, E11 and E12), there was a single occurrence of the imitated word within a long period preceding the imitation. In those five cases where the word was repeated, time lapses are given for the repetitions.

Nothing too assertive should be said about these figures since the qualifications placed on the determination of imitations in the first place have suggested the tentative nature of this area of study. However, two things can be noticed. The first is that in the first session (012) there are several cases of latencies between seventeen and twenty-four seconds.[2] As Brenda's speech develops from (012) to (051) there is a general trend toward shorter and shorter latencies.

The second thing to be noticed is that, whereas in the first session it was possible to find four fairly clear cases of imitation (there were others that some wider definitions might have included), in the last two sessions there was only one case each. It appears that direct phonetic imitation has declined in importance somewhat as BRENDA I has progressed.

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[1] I used a stop watch with 1/5 second as the smallest interval. Of course, these measurements can be no more exact than my hearing and reflexes would allow.

[2] It should be noted that these long latencies approach or perhaps exceed the limits for pauses in American English conversation. Because of the long delays it was only by working back through the tapes that I was able to recognize these early utterances as imitations.

V.2.3 Systematicity in Imitations

It was suggested in Chapter III that the phonological study was largely based on spontaneous utterances. Now we can return to look at the phonology of the few imitated utterances to see to what extent it varies from the system described previously. At first glance it is clear that there is no very great difference. We do not find an abundance of velars or four syllable utterances. In general, the same conditions hold here as in the productive system. Words are mostly monosyllables of CV shape. What can be noticed are several incipient changes in the phonological system.

As early as (021) there is [bau] for book. In (022) boat is imitated as [bæ]. In (032) and (041) there are two more examples of [b]. There are also several examples of [ʔ], [p] and [l] occurring as final consonants.

It should be remembered that in the phonology of tape (012) <da> was given as evidence for the nasal/oral split of the first consonant. Now it is seen that this <da> can be considered an imitation. However, by the next week (021) it has been incorporated into Brenda's spontaneous system. In the same way it seems likely that the difficulty of the labial/dental opposition for the last session (051) can be cleared up somewhat with these examples. We can see that although, perhaps, Brenda does have an [m]/[n] distinction in (051), she is still working on the [b]/[d] distinction. It looks as if what is selected out for imitation by Brenda are just those distinctions she is in the process of developing. In the period between (021), when she has reached

Stage 2 of Jakobson's stages, and (S11), when she has reached Stage 3, her system is in flux. During this time she becomes aware of the next contrast, perhaps first in receptive competence, and selects just those items that demonstrate this contrast for imitation. By this process she is able to learn the contrast finally for production.

V.2.4 Function of Imitation

I have suggested that the function of imitation is to seek out examples of contrasts for practice and eventual incorporation into the child's own phonological system. Two of the features of these imitations indicate that this is the case. One is the long latency between the model and the imitation. This may indicate that the child has noticed a relevant model, but because it is not within her productive system it takes some time to process. It would not be surprising if this processing effectively blocked any other utterances on the part of the child or the hearing of any of the input speech in the interim. It is true that in the examples cited Brenda virtually blocked out any further input.

The second thing that would be expected is that the necessity of imitation would vary depending on what stage in development the child was in. We would suppose that when a child had recently acquired a contrast she would then be more interested in practicing that new acquisition than in seeking out new changes. This is one explanation that would be offered for the decrease in the number of imitations in BRENDA I. She is reaching a period in which Stage 3 will be stabilized, and she is actively perfecting the system she has.

Example 15, Table 14 shows how the process of refinement takes place. It is repeated here.

(051)121 abθ
122 ada
(S) She wants another one.
123 ada
Atha?
124 adðaʔ
Ada.

There is still a slight processing delay. When Suzanne says "another" Brenda does not immediately correct, but there is a slight affrication in the stop in 123. Suzanne on her part corrects in the direction of Brenda's speech, but stops short of going all the way to Brenda's [ada]. Then Brenda gets Suzanne's form and Suzanne gets Brenda's original form. It should be pointed out that in Hawaiian English ada is a stereotyped variable of Standard English other. This example shows that in the course of the eight weeks Brenda has gone from slow and perhaps difficult imitations to rather quick and subtle imitations. But these imitations only slightly expand the limits of her current phonological system.

V.3 Repetition vs. New Utterance -- The Problem of Variation

In discussing the methodology of doing phonology on Brenda's speech, the problem was raised as to how to decide which utterances were repetitions of the "same" word and which utterances were new words. I felt that when utterances were said in a more or less close sequence, with approximately the same phonetic shape and an unvarying context, they could be taken as repetitions. In this section some of the details and problems of that method are discussed.

First a note should be made about a certain type of circularity that will arise shortly in the discussion of constructions. If a sequence such as [nene.nene.nene] is taken as repetition of the same word, what is the basis for thinking later that [awau] in [nene.nene.awau] is not a repetition, but rather the introduction of a different word? The same context and conditions cannot be used for decisions in favor of repetition and decisions against it. Here, as in the problem of the intelligibility of words used spontaneously versus those used in imitation, we find that the linguist must make a judgment at some point in order to break the closed circle of the child's system. The means of judgment can be made somewhat explicit by saying that what is at least marginally acceptable to the adult system can be decided by reference to it. If we make that assumption, then we can say that we take as repetitions those utterances that maintain an intelligible limit of variation and do not overlap with other words in the supposed system.

V.3.1 Latency of Repetitions

This section will give some specification to the idea of a word being repeated in sequence. Table 15 is a list of some repeated words taken from tapes (012) and (051). It can be seen that for (012) there are two basic types of latencies--long and short. The long latencies are between 3 1/5 seconds and 8 1/5 seconds; the short are all 1 3/5 seconds. There are only three of the short type. The rest are long.

In (051) the same two categories hold except there are many in the short category (with 2 4/5 seconds as a maximum) and only a small number of long pauses. As can be seen from these examples, the timing of the short pauses has not varied importantly over the eight week period. One second seems to be the lower limit on the short pauses (only two instances). On long strings such as (051)46 through 52, (051)93 through 98, and (051)134 through 141, there is a peculiar symmetry with the intervals shortening and then lengthening again.

V.3.2 The Place of Repetition in the System

The number of repetitions is an indication of a kind of development. It should be noticed that the four examples of (012) are exhaustive. Those of (051) are selected out of many more. Not included in Table 15 are data from (052) and (061) in which even greater extremes are reached. In those cases most of the words Brenda says are repeated. The maximum seems to be six to eight repetitions, but sequences of two or three repetitions are by far the most common. Of course there has been quite an increase in the total number of utterances in each session since the beginning, with sixty-six in (012), 183 in (061), and 399 in (052). What is clearly happening is that Brenda does not increase significantly the number of types but greatly increases the tokens.[1]

V.3.3 Function of Repetition

There are a number of causes of a high number of tokens, i.e. repetitions of the same word. One is that when Brenda says something there is no response, and so she says it again. Associated with this is the fact that it is difficult for others to understand her. A look at the transcriptions shows many instances of Brenda's utterance being followed by a request for repetition or clarification, such as "what?" or "doll?" or "you want?"

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[1] See V.6.4 for a fuller discussion of types, tokens, and uses, (p. 122).

A further cause could be a difference in the latency of production interacting with conversational latencies. Adult speakers have quite definite intervals beyond which it is felt that a new utterance is called for. It could be that Brenda had said a word and the quick adult response might have been too soon for her to process. Meanwhile she has begun the production of the repetition. This, of course, could be studied by looking at latencies in adult responses and then actively trying to alter the adult system in conversation with children.

Probably the most plausible explanation of this high number of repetitions is that Brenda is using them to learn phonology. If it is true, as I have suggested, that repetitions are a useful means of deciding about phonetic variability, there is no reason to suppose that this is not the case for Brenda as well. By keeping everything else constant (context, intent etc.) she could vary the phonetic shape to see what gets understood. It may be too much to think that this is intentional, however. Most probably it is a combination of the adult's lack of understanding, further prompting, and Brenda's experimentation that leads to this development of repetition.

V.4 Conclusion to Discourse Redundancies in BRENDA I

It has been shown that imitation and repetition are two phases of the same learning process. Imitation provides the means for the child to practice contrasts that are not yet within her own productive phonological system. Repetition provides the means for elaborating that system from within and testing it against the model system. It is interesting to notice the relative shift in importance of these two mechanisms between (012) and (051). In (012) imitation was considerably more frequent than in (051). For repetition just the reverse was the case. In light of this it would not be surprising to see the periodic waxing and waning of these two elements of adaptation as the developing system advances from stage to stage.

V.5 Imitation and Modeling in BRENDA II, age 1;7.2 to 1;8.21

In BRENDA II it has become more difficult to find clear cases of imitation. There may be several reasons for this. As I will show in V.5.4 (p. 115) below, the latency between the imitation and the word imitated has become quite short. This, coupled with the greatly increased vocabulary and fluency in its use, makes it hard to separate true imitations from simply appropriate responses to others' speech. On the other hand, although the latency may be quite small, apparently Brenda's memory has developed sufficiently to allow her to delay the imitation.

I want to recall the distinction I have made between an utterance which is an imitation and one which has been modeled. In either case there has been an instance in another speaker's speech of the word the child says. To call an utterance "modeled" does not necessarily mean that it is an imitation. It only means that we cannot guarantee that it is not an imitation since a model was present. In the discussion that follows, utterances will be divided into those that are quite clearly imitations and those that only may have been imitated, that is, modeled utterances. Table 16 gives some examples of both kinds of utterances found in BRENDA II.

V.5.1 Obvious Imitations

There are several indications that a word is really imitated. One of these is when the suspected imitation immediately follows a model in the environment, but that model is of no direct relevance to what Brenda is doing at the time. Example E13, Table 16 shows a case of this type.

The most frequent single type of clear imitation is that which is elicited by adults. About half of the total of imitations are of this type. It sometimes happens that Brenda uses a different word than expected and the adult corrects her. She then imitates this correction. E3 occurred when Brenda mistakenly called Suzanne Wendy. The group in E10 clearly shows how willing Brenda is to participate in this kind of imitative dialogue with Charlotte. In E4 we can see how this process works out on some occasions. The mother tells Brenda a word, repeating it several times. She then asks Brenda to name the object. Only a few examples have been given here. There were about 50 clear cases (out of a total of 2940 utterances in BRENDA II).

A third type of imitation which is considerably rarer is that of a spontaneous imitation of some stressed word, as seen in E2, or the repetition of some word which is marked in some other way. E1 shows a case of the second type where Charlotte makes a pause before the imitated word.

Finally there is one interesting example of a rather strange imitation, E7. Brenda says bus several times. The mother recalls the story of Brenda saying the lady on the bus was wearing a blanket. The mother laughs when she says "bus" and Brenda immediately imitates the interrupted vowels in the mother's dangling pronunciation of bus. Since this is the only case of this kind, not too much should be made of it. It does, however, point up a rather subtle awareness of phonetic detail in imitation.

V.5.2 Modeling

There are some cases where a word occurs before Brenda says it, so that there is the possibility of imitation. E6 is a case of this sort. Brenda knows the word monster and has used it before on earlier tapes. When she says monster it is open to question whether this is a response in imitation of Charlotte's word or simply a response to the picture that Charlotte is drawing.

A second consideration has come up during the earlier discussion of phonology. Although in some cases it is quite difficult to claim that Brenda has directly imitated because of a time lapse or intervening speech, there is nevertheless a change in the phonological shape of her utterance, and this change is in the direction of the model.

E11 is the example which was quoted above (III.8.1, p. 70). Between my model hiding and Brenda's improved version of hiding Brenda has said the word balloon. If this is imitation it is delayed imitation.

It is not at all uncommon to find that Brenda's pronunciation improves even though there is a delay of several minutes and the conversation has been about different things in the interval. This is a fairly strong indication that Brenda's mental representations of adult forms are quite mobile and susceptible to alteration, even though she does not immediately practice the form.

V.5.3 Position and Stress

I suggested in V.2.1 (p. 102) that the position and stress of the word imitated were important. Now we can see that for BRENDA II this idea must be modified. In the elicited and spontaneous imitations, the words imitated are either stressed or placed in a position of significance by pauses, as mentioned in E1. However, in the case of modeling it is not necessarily the modeled word which is stressed. In E9 it is shoyu that receives stress rather than much, which is the imitated word. Apparently by this stage Brenda can select utterances for imitation from the speech stream whether or not they are stressed.

V.5.4 Latency

In BRENDA I I noticed that with development the latencies for imitations decreased. For these imitations in BRENDA II we can see that she has become quite adept. Some of them occur as quickly as within 3/5 of a second, with rare cases showing a lapse of four to six seconds. It is interesting to note that in response to the mother's speech the latencies are shortest (3/5 to 1 4/5 seconds, typically). It appears that she is "tuned" to her mother's speech. With other adults the latencies are slightly longer (1 to 2 2/5 seconds). This range of 3/5 to 2 2/5 seconds covers over two-thirds of the total imitations for BRENDA II.

Now that we have seen that the latencies are normally quite short, we can see a reason for some of the longer ones that occur. In E10 when Brenda imitates three she has a 4 3/5 second delay. It is plausible that this is because three is a more difficult word for her than the words in the first two numbers. It should also be pointed out that she often says one and two spontaneously.

A second type of difficulty shows up in E5. Brenda has said egg. Suzanne says tamago (Japanese for 'egg') and Brenda delays 4 4/5 seconds before imitating. It is likely that Brenda is familiar with this word, although she rarely volunteers any Japanese words. It could, perhaps, be a case of trying to reconcile these two words for the same object that causes the delay in this case.

One final case is that of E14. Apparently Brenda is imitating the longer phrase bumped her head, and to do this she has to produce two words, bump and head, in sequence, neither of which would be particularly hard for her. However, there is a 5 3/5 second delay in producing the sequence. This is the type of evidence for increased complexity that I point to later in VII.1 (p. 144) when I discuss words which serve as elements in constructions.

V.5.5 Systematicity of Imitation

As we have seen both in BRENDA I and in the discussion of phonology, the imitations Brenda makes do not differ widely from her phonological system at the time. They seem to add just those elements that are currently developing. E11 in which Brenda adds the velar nasal, or E12 where the final voiced stop occurs in the first instance and then disappears, give evidence for this suggestion.

V.5.6 Function of Imitation

In V.5 (p. 112) I said that clear cases of imitation are somewhat harder to find in BRENDA II than in BRENDA I. Out of a total of 2940 utterances there were about fifty clear cases. We should not expect to answer many of the questions of Brenda's development by looking solely to these imitations. However, it can be seen that the imitations do have several uses in Brenda's system.

One of these uses is the practice of forms while the adult model is immediately present. This allows for the expansion of the phonological system. Related to this function is the simple increase of vocabulary. It is not to be supposed that every word must be imitated before becoming a part of Brenda's vocabulary, but apparently some of them are.

Another function of imitation may be useful in later syntactic constructions. In E8 and E9 the word imitated is semantically salient although in E9 it is not stressed. It may not necessarily be that Brenda has to imitate these words to learn about their salience, but their imitation in the context of a dialogue allows for further feedback and verification of her choice.

A final case that is important to mention is that of E15, which has already been discussed above (III.10, p. 80). (141)173 was a spontaneous imitation of my *microphone*. 174 and 175 were emphatically elicited. It is interesting that form 174 took her longer than 173, although it was, in fact, shorter and more consistent with Brenda's system at that time. I mentioned above that after a two-month hiatus when I say Brenda for the first time since (141), as I took out my tape recorder she said [məik^{y}əfon]. The family can remember no cases in which Brenda would have heard the word in the interval. There is no tape recorder or microphone in the home. It is quite evident that Brenda had remembered the adult surface form until her own production limitations were reduced.

These imitations in BRENDA II do not represent a very large portion of the data. They do indicate, however, an important sensitivity to the speech environment, which is one of the undoubted requisites for language development.

V.6 Types of Repetition

I will turn now to the other aspect of discourse redundancy, repetition. In BRENDA I there was no need to distinguish types of repetition. However, in BRENDA II there seem to be two sometimes distinct types, phonological repetition and discursive repetition.

V.6.1 Phonological Repetition

The example I gave in III.6.1 (p. 58), in which Brenda successively approximates the adult surface form of the word *shoe*, is a clear instance of phonological repetition from (071). What follows is another example, this time from (141).

(141)108 gɪɛuf
109 gɪɛv
110 gɪv
111 gɪv

Repetitions of this type are most common among spontaneous words. Notice that Brenda requires no prompting to continue altering the form. Also notice in both the case of give from (141) and shoe from (071) that once the correct form is reached it is repeated. This may be an indication that Brenda knows what it is she wants to say and when she has succeeded.

V.6.2 Discursive Repetition

Discursive repetition involves repetition until the word is understood and gets a response. The following example is from (111):

(111)1	fe̞͡ɪ	(Brenda is looking at electric fan)
2	fæ̃	
		(M) Hm?
3	fæ̃	
		Bathroom?
4	faŋĩ	
5	faɪ	
		Fan! Yeah.
6	$\mathrm{k^hu}$	
		Cool, yeah. Fan makes you cool.

It is clear that Brenda persists in spite of the mother's misunderstanding until after 5 [faĩ] when the mother gets it right. Further evidence that she really is saying fan is that as soon as the mother guesses right Brenda is prepared with the comment, that is, that it is cool. This comment the mother understands immediately and there is no need for repetition.

A second example from (111) shows even more definitely what Brenda is doing.

(111)111	kʰa	(A car passes in the street. R does not hear it at the time.)
112	kʰa	
113	kʰa	
114	kʰa	
		(R) What?
115	gɔo	
116	go	
		(S) x x x
117	bəiš	
118	bəiš	
119	bəiš	
120	bəiš	
121	bəiš	
122	bəiš	
123	bəiš	
124	bəiš	
125	bəiš	
		(R) What? Oh, bicycle? Is that what you said?
126	naʔ	
		No?
127	naʔ	
		No--I got it wrong. (laugh)

When Brenda first says car I don't understand, since I had not heard it. It was very clear on the tape, however. Brenda says it four times, and then as soon as I respond she changes to go. She says that twice until Suzanne says something which, unfortunately, is inaudible on the tape. Brenda then guesses correctly that we haven't understood and then says bus. This was verified from tape (121) in which she uses bus in the clear context of a story. When I suggest that she is saying bicycle she doesn't hesitate to say not[1] and shakes her head 'no'.

What can be seen in this example is the fact that Brenda does have definite intentions. She says the word until she gets the response, and this response can be of two types. One type of response is to simply say the word, thereby confirming that what she has said translates to you in a certain way. A second type of response is just to ask her if that's what she said. She apparently is ready to say when it is wrong.

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[1] Hawaiian English often has "not" as a one word negative indicating a denial of some assertion.

Of the repetitions in BRENDA II this type is by far the most frequent. However, it can be seen that the distinction between discursive repetition and phonological repetition is not always easy to maintain. As an example of the mixture of the two types we can look at the following from (071):

(Brenda has been drawing pictures. She draws one she says is a <wowow>, i.e. a dog)

(071) 366 bəm
367 bəm
368 bam
369 bəu
(M) Hm?
370 boĩ
371 boni
372 bəunĩ
373 boni
Brown? Hm?
374 meuš
375 rous
376 rəuh
Ralph? Yes, Ralph is a dog.

In this case Brenda's bone improves somewhat but the mother never succeeds in understanding bone. Then Brenda does an interesting thing. She gives up on bone and starts saying Ralph, the name of a dog which belongs to Brenda's cousins. This is further evidence that Brenda was in fact saying bone.

V.6.3 Latency

It is clear by now that Brenda has developed a considerable fluency since BRENDA I. It can be seen in the latencies between repetitions. In the first case of the phonological repetitions these lapses are very short. In the *shoe* example quoted we find the following intervals between the first seven utterances: 3/5, 4/5, 3/5, 3/5, 3/5, 4/5 seconds. There is a lapse of 1 1/5 seconds while Suzanne says *shoes*. Then between the last three words we find 1 1/5 and 1 seconds. These lapses are quite typical of phonological repetitions. There is only a short breath taken between.

In one interesting case (071)59 the pause gets put in the wrong place with the result that the final consonant of one word gets placed at the beginning of the next word.

(071)59 hæ?:thæ? (i.e. *hat.hat.*)

In this case the pause of 4/5 seconds is that which is typical between words.

In discursive repetitions the latencies are only slightly longer than for phonological repetitions. Typically they are around one second, ranging between 4/5 and 1 4/5 seconds. They are rarely longer than that.

V.6.4 Place of Repetition in the System

Having described the different forms of repetition, we should now see to what extent it is representative of speech in BRENDA II. First a three-way distinction must be made among "type", "token" and "use". An example will illustrate these terms.

(141) 2 hiding
3 balloon
4 hiding
5 hiding
6 hiding
7 hiding
8 hiding
9 hiding

In this example there are two "types", *hiding* and *balloon*. There are eight "tokens", one token of the type *balloon*, and seven tokens of the type *hiding*. There are three "uses", one use of *balloon*, and two uses of *hiding*. In the first use of *hiding* there is one token but in the second use of *hiding* there are six tokens, or also in the terms of this study, repetitions. It is important to notice that if repetitions are derived by simply dividing tokens by types, the number of repetitions for a particular use is obscured.

Of the 63 uses of words in (071), 17 were not repeated; that is, they occurred singly. 14 received one repetition, and 12 received two repetitions. The maximum repetition was fourteen, but there were cases with nine, ten, and eleven repetitions.

To summarize these data for (071) we can say that about one fourth of the words of (071) occurred singly. About forty percent received one or two repetitions. That is to say, when most of the words in (071) were used they were repeated, and the most common pattern was one or two repetitions.

By (141) the situation had changed somewhat. There are 325 tokens and 71 types. Of the 71 types there were 129 uses. 61 of these occurred singly. 30 had one repetition and 22 had two repetitions. That is to say, just a little less than half occurred singly, and of the remaining half most occurred with only one or two repetitions. The maximum was eight repetitions.

Table 17 summarises these data in graph form. As these graphs indicate, there has been a considerable reduction in repetition during BRENDA II.

V.6.5 Function of Repetition

Since one function of repetition is to successively improve the phonetic form of Brenda's words, it is clear that repetition should decrease as Brenda's phonological system approaches the adult system. As she continues to develop her pronunciation skills, she can get to the intelligible form quicker. A second function of repetition has been seen to be that of getting a response from the listener. As Brenda's phonological system improves and as her vocabulary increases, her speech is more readily intelligible. The result of this is a reduction in the number of repetitions needed to get others to understand. It can be seen, then, that the reduction in the amount of repetition demonstrates that the function of repetition--intelligibility--is being met in other ways by the end of BRENDA II.

V.7 Conclusion to Discourse Redundancies

In the discussion of imitation we saw that imitation in BRENDA II was getting rarer. We also saw one example of the imitation of a longer sequence, i.e. (141)125 and 126 [bɵmp.hɛ]. Further, we can see that repetition is getting rarer. This is an indication on the one hand that at the level of single words Brenda is achieving considerable intelligibility. In the discussion of construction I will show that this is an indication of a shift of focus to a somewhat broader level, the level of the several word construction, i.e. vertical construction.

CHAPTER VI

Discourse

VI.1 Dialogue in BRENDA I, age 1;0.2 to 1;1.22

I am using the term "discourse" to refer to two somewhat different things. The first meaning is that of a series of utterances by the same speaker that form some kind of connected whole. Monologue might be an appropriate term for an adult, but it seems quite exaggerated to call anything a child as young as Brenda could produce a monologue. The other type would be called dialogue. For Brenda dialogue seems more appropriate, although in the earliest part of this study, BRENDA I age 1;0.2 to 1;1.22, there is very little that one would want to call dialogue. There is an occasional utterance that with some stretch of the imagination might fall into this category. (1) below is the only example offered here. On the whole, at the beginning of our study it is difficult to see anything but imitations or words in response to objects or events. Further on, however, Brenda does start to develop the ability to respond to speech with speech. The examples given here are divided into two groups. The first three are rather marginal; the other two, (4) and (5), are good examples of the type of dialogue between Brenda and adults that has developed by the end of BRENDA I. The first example (1) is from (012). (2) and (3) are from (061). (4) is from two weeks before, (051). Finally, (5) is from (S11), the very last tape of this series.

(1) (012)		(R) Do you want some more? (i.e. juice)
46	neneneu	

(2)	(061)6	hævo	(B playing with telephone--holding receiver to ear)
	7	ye:	
	8	edi	
			(C) Daddy, yeah.

(3)	(061)		(B playing with telephone)
			(R) You disconnected the phone.
	30	əlda?a	(B pushing away receiver)
			(C) You through, yeah? Yeah? You through, yeah?

(4)	(051)		(B, M, R looking at picture magazine)
	53	ala	
			(M) What's that? Hm. Sausage. Un. Yum-yum.
			(R) What's this, Brenda?
	54	ælə	
			(M) Um.
	55	æyɨ	
			(M) You want? That's French fries.
			(R) Um. What's this?
			(M) Mm.
	56	m	
			(M) (laugh)
			(R) (laugh) I agree. It looks good.
	57	mæ	
			(M) manman. (i.e. 'solid food') Um hm.
	58	məmæ	
			(M) Yeah.
	59	mɛmæ	
	60	ava	
			(M) You want? Oh, can't eat from that.
			(R) Oh, look. Here's some fish.
	61	dædi	
			(R) What?
	62	awəu	
			(M) Hm. Oh, yes. That's for Daddy. Yes, for Daddy.

(5) (S11)

(M) Uh. Three. Three pennies. See? Have one more?

205 ɨvəu

Chodai. Chodai. (i.e. 'please give it to me.')

206 ɨwəu

Um hm.

207 dəwo

Thank you.

208 daʔ

One more.

209 ɨwɛʔ

Thank you.

210 duo

One more.

211 dowəu

Pen? You write. You write with pen. Yeah.

(1) might be a case of the answer to a question. There is the somewhat characteristic time lag--20 4/5 seconds in this case. This first example is from the earliest tape. The other examples are at least two months later. (2) and (3) might better be called self-accompanying dialogue. In (2) Brenda is pretending a phone conversation. Notice the correct use of the ritual hello. She is apparently pretending to be talking with her father. (3) sounds very much like all done which would certainly be correct in the situation. In both (2) and (3) notice Charlotte's interpretive role. She is playing with Brenda and not trying to explain to anyone else.

The conversations of (4) and (5) are the only two examples of dialogue of this length. Notice in (4) the prompting of the conversation by the adults. By way of contrast notice that in (5) this type of prompting is absent. Brenda's words are taken just as she says them and the the mother responds as if her understanding were complete. The mother reported, however, that she didn't really understand anything that Brenda had said. It is interesting to notice that in this case where the discourse is quite fluent the content is highly unintelligible, even more so than for other uses of speech on the same tape. One gets the impression that to accomplish both tasks--discourse structuring and phonological structuring--at the same time is not possible at this stage. This suggests that there is an interaction in complexity between phonological structure and discourse structure so that an increase in one causes a decrease in the other. This same phenomenon in discussed later (VII.1, p. 144) with vertical construction.

I suggested in the discussion of phonology[1] that some concept of successive approximation was needed to explain the child's developing phonological system. In the discussion of imitation a type of system was suggested in which the child would imitate just those elements she was in the process of learning. Here it seems consistent to propose that on this level of the higher context of language a similar type of development takes place. It is plausible to suggest that Brenda has first developed a basic phonological system, one that works well enough to make her utterances intelligible to adults (at least concerned adults). Then on the basis of that quite simple system she begins to develop the socially interactive uses of speech without particular attention to the phonological form or semantic content of the words. Here again it seems that Brenda is developing her language by first focusing on one aspect and then another, and while focusing on one aspect she of necessity temporarily suspends or at least decreases activity in another.

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[1] See especially III.5, p. 57 and III.10, p. 80.

VI.2 Stories in BRENDA II, age 1;7.2 to 1;8.21

By BRENDA II the situation has changed considerably. I found many examples of stories (monologues) and conversations (dialogues) as well as the harangue that follows. In spite of the restrictions of a rather limited vocabulary and expressive means, we can see how well Brenda is able to piece these few words into an urgent demand for attention. In this section I have changed to an orthographic translation of my transcription for ease in understanding the flow. (It should be remembered that the translation here misrepresents the actual phonetics.)

(6) (131) (C and B are playing in the sandbox at making sand cupcakes. C began to scoop up sand from where B was playing.)
(C) I'm making plenty cupcakes so I'm trying to get plenty.

141 plenty
142 plenty
143 plenty
144 plenty
145 plenty
146 fight
147 fight
148 no fair
149 fight

I have said that in BRENDA II Brenda tells stories. Stories are taken to mean sequences in which the words Brenda uses are part of a larger whole that taken together has a unified meaning. In telling them she is not significantly assisted by another speaker. In the examples that follow these points will be easier to see.

(7) (081)163 tape (Pointing to recording tape)
164 tape
165 tape
166 tape (Pointing to band-aid tape)
167 tape
168 Brenda
169 hurt
170 Mommy
171 Mommy
172 band-aid [bænīʔī]
173 hurt
174 hurt

The gist of the story is clear. The mother had put a band-aid on Brenda's sore. Incidentally, this not something that I knew before Brenda mentioned it.

(8) (091)44 duck
(M) Hm?
45 duck
46 swim
47 swim
48 swim
49 swim
50 duck
Can duck swim?
51 Brenda
Brenda swims?
52 Mommy
53 swim
54 swim
Mommy swims too.
55 Charlotte
Un hm. Charlotte swims too.

This is not as clearly a "story" as (7). However, it is Brenda who leads and it is common for the mother and her two children to go to the beach.

(9) (111)15 nen night	(B reaching for cushion and pretending to sleep)
16 daddy 17 daddy	
	(M) Yeah, Daddy nennen (i.e. 'sleep') on that last night.

In this example Brenda is telling us about the nap her father took and then demonstrates by pretending to sleep.

(10) (121)	(M)...long skirt you know and the pattern it was a check just like a blanket--Charlotte's blanket and she said, "Lady, blanket, blanket." She thought lady was wearing blanket.
49 Brenda 50 sleeping	
	Hm? Yeah, you thought lady was wearing blanket, didn't you?
51 bus 52 bus	
	Yeah, on the bus, hm?

What is interesting about this story is that Brenda is talking about sleeping on the bus which is more or less not understood by the mother. Later after making the transcription of the tape I asked the mother how they went to the doctor's office and if Brenda had slept in the office or on the bus. The mother reported what Brenda had told me: she always falls asleep when they ride on the bus.

(11) (121)	(B is holding a porcelain bank in the shape of a rabbit)
166 rabbit 167 rabbit	
	(R) Yeah.
168 daddy 169 daddy	
	Oh, that's his bank.
170 playing 171 playing 172 playing	
	Is that your daddy's bank?
173 bank 174 Brenda	

The story as reported by the mother is that the evening before the father had played with Brenda and Charlotte while the mother was out. They had been playing with the rabbit bank which was not the father's bank but Charlotte's.

V.3 Conversations in BRENDA II, age 1;7.2 to 1;8.21

It is obvious that in the stories above there is never a complete independence from interaction with other speakers. In the conversations this interaction is at a much higher level. This is by far the most common type of discourse. Because so many examples of this type of interaction are given throughout this study only three will be given here.

(12) (081)			(M)	Tell Ron what swims, Brenda.
	47	turtle		
				What can swim?
			(C)	Turtle she said.
			(M)	Um hm.
	48	swim		
				Yeah.
	49	swim		
				What else can swim?
	50	fish		
	51	fish		
	52	water		

In (12) we see a type of conversational prompting that is often used between Brenda and her mother.

(13) (111)				(R, M, S are all sitting on the floor eating ice cream and temporarily ignoring tape recorder and notebook in which contextual notes were usually written)
	176	tape		(B trying to move tape recorder)
	177	tape		
	178	word		(B holding mike up to S's mouth)
			(S)	Hm?

179 word
180 word (R) She said, "word".
181 word (M) She wants you to say a word.
182 word
(R) Yeah, she says--she holds it up to Suzie like that.
183 paper
184 paper (B giving notebook to S)
185 paper
186 paper
187 paper (R) What's wrong? You think we're not doing our job just cause we're eating ice cream?
188 pen (B gives pen to S)
189 pen
(R to S) See? Now do your job! Pretty soon she's gonna give me an exam.
190 tape
191 tape
(R) Yeah. O.K. Everything's under control. We're doing it all right.

This example, apart from being strong evidence of the awareness Brenda has of what we were doing and the functioning of the various elements of the recording session,[1] shows how well she can participate with adults in a conversation of her own direction.

(14) (121)67 Kimby
(M) What about Kimby?
68 close [koš]
Closed? What did she close, hm?

This final example is given to show the basic structure that can be seen in many of these conversations. Brenda begins by saying some word. This word is taken by the adult as the topic of a topic-comment pair. The adult shows in one way or another that the word has been understood, and gives the signal for Brenda to elaborate. Brenda then goes on to the comment. This example demonstrates the way in which the discourse is patterned and segmented in many cases.

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[1] For Bloom's contrasting point of view see II.1.3, p. 13.

VI.4 Segmenting Discourse

The data of (141) were marked for conversation and story fragments. The first sixty-one utterances will illustrate the method. (141)1 tape stands alone on a stretch of ninety "feet"[1] of tape. It can easily be isolated. 2 through 61 form a second group in which Brenda and I talk about several balloons behind a curtain. I then pick up Brenda and we go to pull back the curtain to look for them. Within this larger group, 2 through 61, there is what might be called a parenthetical expression. In 27 and 28 Brenda says tape.step. as we get up on the sofa, and she pretends to step on the tape recorder. Then we return to the balloon when I ask, "Where's the balloon?"

From 1 through 61 then, there are three fragments. The first is initiated by Brenda and answered by me, after which Brenda says nothing. The second is initiated by Brenda when she says hiding and looks up at the balloon. I respond and we continue until Brenda shifts the subject with 27 and 28, i.e. tape.step. I respond to that with, "Don't step on my tape," and then, changing the subject, "Where's the balloon?"

The remainder of the tape has been segmented in this way, noting shifts in the subject. For example, this first long fragment is ended when the mother enters the room and we talk about 1 through 61. That is, we shift levels by having a conversation the topic of which is the conversation of the first part. It is interesting to see that

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[1] The Sony TC110A tape recorder counts approximately 500 units of tape per half hour. I refer to these units here as "feet".

Brenda shifts quite easily with us and says, balloon, Mommy, curtain and Ron, which suggests that she is telling the mother about what had just taken place while she was gone.

There are later examples of this same shifting of levels. Brenda is quite able to talk about both the contents of the books we are reading (e.g. owl, flying, boy etc.) and the acts of reading the books (e.g. please read, page, turn etc.) Once again the idea that children are very much in the here and now needs to be clarified. These shifts certainly imply an ability to abstract from the immediate situation of handling, reading, turning pages and so forth. She is clearly able to understand pictures as representations, as was evidenced as early as BRENDA I in her ability to identify pictures of objects in her own home.

The discourse fragments were classified according to subject shifts. There were found to be at least twenty-seven fragments in the half hour tape (141). These twenty-seven fragments were of four types. Type (1) are "closed" fragments in which someone initiates a subject, another speaker answers, and then the initiator makes a further comment on the same subject. This loop may be repeated but always ends with the initiator having the last word. These closed fragments, then, are complete loops.

Type (2) are "open" fragments, or two sided conversations in which there is no closing of the loop. That is, the initiator does not (or cannot) respond. (141)1 was a case in which Brenda did not respond to my "Yeah, we're taping again, Brenda" out of choice. 27 and 28 were a situation in which Brenda did not respond since I changed the subject.

Type (3) are "unilateral" fragments in which there is no response, but the utterance has some definite content. An example of this is 198 to 200 where Brenda says, Brenda three times as she starts to open a book as if to read and gets no response before she changes the subject herself.

Type (4) are "zero" fragments which are unilateral utterances with no apparent content. There is one utterance of this type, 120 nighttime, which was a simple imitation of Charlotte's word to which no one responded and which Brenda did not expand.

Of the twenty-seven discourse fragments Brenda initiated twenty-two and I initiated four. One fragment was the zero type. Twenty-three of this total of twenty-seven were of the closed type; that is, whoever began also finished. Two of Brenda's were of the open type, one of the unilateral type and one of the zero type. If we consider that of the open types one was quickly shifted by me, it leaves the first utterance (when Brenda was still sleepy from her nap) as the only example where Brenda started a subject and did not respond to the response. The nighttime case was unique.

The remaining nineteen show the closed loop pattern. It looks as if Brenda, at least in this recording session, is highly interested in controlling the conversation, but that she generally does not leave the subject without first getting feedback from the other speaker and then verifying the feedback in the form of the closed loop discourse pattern.

Brown (1973, p. 44), in his discussion of chimpanzee and human language, suggests that the distinction between the cognitive abilities of chimpanzees and humans at the earliest stages may not be tenable. He does question, however, why the chimpanzee does not initiate language if the fundamental cognitive ability is present. His suggestion is that the initiation of communication is an important distinction between human and other primates and that, in fact, it should be considered an essential design feature of human language. This pattern of discourse in (141) certainly indicates that Brenda is actively attempting to initiate communication. In this aspect I feel that Brown's suggestion is strongly supported by this study.

VI.5 Summary of Brenda's Discourse

In this first part of the chapter I have tried to show to what extent Brenda's ability to use her developing language in a speech context has matured. It should be clear from the examples given that by the end of BRENDA II there is a very good control of the broadest outlines of discourse. Brenda has a quite highly developed ability to use speech in ways that adults do. I suggest that this sensitivity to discourse and, in general, to speech in context is the foundation on which constructions develop.

VI.6 Adult Speech

After having made many indirect references now to the speech of adults in interaction with Brenda I want to look more closely at adult speech itself.

There is no need to point out that mothers often understand things their children say when others cannot. Unless we suppose that part of the maternal instinct includes a biologically rejuvenated language acquisition system, we can see that what goes on linguistically between mother and child (or other adults and child, or child and child) is an interaction between two linguistic systems. It seems reasonable to assume that communication occurs to the extent that these two systems overlap. Change occurs in one or the other to the extent that either speaker is willing or able to vary his system for the purpose of communication. This would imply that the mother, in the interest of helping her child into her cultural-communicative world, would find it most useful to extend her system maximally at first, and then continually withdraw it towards the "standard" dimension as the child succeeds in altering his own system. It further implies that in cases where two or more young children interact, such as in the case of twins, the need to alter their own systems may be lessened, and consequently development toward the standard system (i.e. the adult system) would be slowed. It also implies that that all adults have this ability to understand utterances considerably beyond what they themselves would consider standard and that they can use this ability as a means of increasing or decreasing communication in any situation.

There is nothing particularly new in this idea. It does suggest that the investigation of the language adults use with children is as productive and necessary a study as the reverse case. As a means of getting at this study I have determined the mean length of utterance (MLU) for two adults, the mother and myself, both in interaction with Brenda and with the other speakers. The data are taken from a tape for an early session (041) and again for the latest session (171) recorded. I have also counted up questions and declaratives/imperatives. Finally I have figured the percentages of the total speech directed to either Brenda or the others. These figures are given in Table 18. Table 19 illustrates these figures with graphs. Of course, they will need considerable explanation.

I should say first that statistics of this sort are only general indicators and should not be taken too seriously. There is also a problem of the sample size. I have used Brown's (1973, p. 66) rules for tabulating MLU's. However, in the case of any speech but that of young children the MLU is highly inaccurate, as Brown points out. Further, in the case of speech between adults there was never a full set of 100 utterances on any one tape. The MLU's for adults to adults have been calculated on a smaller set, i.e. whatever happened to occur in that tape.

The figures on questions have been derived by counting question marks. Of course, this does not indicate sentences which have a declarative form but a question intent.

The percentages of speech have been figured on the total which appeared on the half hour tape under consideration. In spite of the highly tentative nature of these statistics, I feel that they are striking enough to give a broad indication of several interesting phenomena.

In the first part of Tables 18 and 19 the MLU's are given. Comparing the mother's MLU in speech to Brenda with Brenda's MLU at that time we can see a clear "development" of the mother's speech. In (041) it averages .78 morphemes longer than Brenda's. In (171) it averages .84 morphemes longer. It appears that the mother is successively retracting her extended system as Brenda develops. That this does not represent a general development on the part of the mother can be seen from the fact that her speech to others remains relatively constant.

In the case of my own speech an interesting fact emerges. In the first place, as the study progresses there is a reverse development in my speech to Brenda. At the time of (041), although my speech to Brenda is simplified in comparison with my speech to others, it did not reach the extreme the mother achieved. With time, however, my system in interaction with Brenda eventually became very similar to the mother's. A second interesting fact is that my speech to others also shows a reduction in overall length. This was an amazing observation to me since, in spite of the fact that I was transcribing my own speech from week to week, I was unaware of any change. Perhaps it may be accounted for by the fact that the mother's Japanese Hawaiian English has a number of features which have the net result of a shorter MLU than for Standard English. In the course of these taping sessions I had effectively varied my Standard English to approximate the Hawaiian English of the home.

The second set of figures in Tables 18 and 19 indicates that in both sessions under consideration the mother and I used many more questions in speaking to Brenda than to others, although in both sessions I used more questions than the mother.

The final set of figures in Tables 18 and 19 indicatesa reversal of roles between the mother and me during these sessions. In the early session a large percentage (87.9 percent) of the mother's total speech is directed to the child. In the last session only 66.2 percent is addressed to Brenda. In the first session I addressed 67.4 percent of my speech to Brenda, and in the last session it was 85.4 percent. Both of us, however, addressed more speech to Brenda than to others.

VI.7 Conclusion to Discourse

This discussion of discourse concludes the presentation of the background material on which the study of construction is based. By now it should be clear that I feel we have to look at a broad spectrum of interaction in order to understand any narrow aspect of Brenda's system. In my attempt to narrow the study of phonology I found that I always had to refer back to my judgment of meaning based on the context of an utterance. In this recent discussion of my own speech I have shown that my own linguistic system was in the process of change during this study. It was changing sociolinguistically in the direction of Brenda's home environment and it was changing in interactions with Brenda (as was the mother's) in the direction of maintaining a bridge across the gap between our systems.

SECTION III

Construction; Horizontal and Vertical

The two chapters of this section are about construction. The first, Chapter VII, takes an external point of view in looking at several types of construction and their development between BRENDA I and BRENDA III. The second, Chapter VIII, looks at the internal structure of the constructions described in VII. In this section the general pattern of presenting a chronological development has been abandoned. The presentation here follows the path of my own discovery. It was a process of continually looking forward and back through the tapes until the full system presented here had emerged from the data.

CHAPTER VII

Types of Construction

VII.1 The History of this Study

I have said several times that at the beginning of this study and for most of the time I was collecting the tapes on which it is based I thought of it as a study of phonology and intonation during the one-word period. At the end of BRENDA II I still thought that phonology was my primary interest. During the last tape (141), age 1;8.21, Brenda said several things which I took as two-word constructions, and on the basis of those I terminated BRENDA II.

Three of these constructions were striking. In the first, Brenda lifted her foot over my tape recorder and while she pretended to step on it said,

(1) (141) 27 tape
28 step

In the second case she reached out with her index finger and delicately touched the microphone saying,

(2) (141) 139 finger
140 touch

Later, while I was turning the pages of a book we were "reading", Brenda looked at a picture of a woman who was cooking at a stove and said,

(3) (141) 201 cook
202 say

I was surprised by this and said, "What'd the cook say?" Brenda's answer was "something".

At the time of making the transcription for this tape (141), however, I did not transcribe the utterances above exactly as they are shown. First, I transcribed them phonetically. Second, I transcribed them on one line of the transcription, which indicated to me that they were all of the same utterance. My ambivalence about their status as utterances is clear, though, from the fact that I gave each part its own utterance number. The reason for my vacillation was that these utterances appeared to be connected in every way but intonation contour. At the time, these utterances and the others like them convinced me that Brenda was either beginning or very nearly beginning the two-word stage.

In the two months that followed I did not take any new recordings. During this time I began the work on which Section II of this presentation is based. In doing that work I kept finding cases in which Brenda appeared to be trying to put several words together in a longer construction. One example of this was quoted in part in the study of phonology, as well as in the introduction (I.1, p. 2). On tape (071) when Brenda was 1;7.2 she held up her mother's shoe and, while she stared directly at it, she said,

(4) (071) 259 mama
260 mama
261 mama
262 mam
263 š
264 šɪ
265 š
266 šɪ š
267 šu
268 šuʔ
269 šuš
(S) Shoes!
270 šɨ
271 šɨ
272 šuʔ

There are several pieces of evidence that indicate that Brenda is making some kind of construction here. The first is that without any intervention from another speaker she goes from the first word, *mama*, to the second, *shoe*. The second indication that she is really trying to say something is her persistence. In spite of rather formidable production difficulties, Brenda persists until a recognizable surface form of each word is performed.

A second example of this sort of construction has been presented in the phonology chapter (III.9, p. 77). In the case of *tall...clown* I pointed out that either of these words when produced independently caused no difficulty in performance. However, when produced together as a construction there were a number of unintelligible but apparently related forms.

In looking again at the constructions of tape (141) I noticed the same phenomenon. In most of these when the words appeared separately there was a form that was altered in some way when used in construction. Several examples will illustrate this alteration. The words *tape* and *step* both appear independently on (141). The phonetic shape of *tape* is [t^heip]; *step* is[tɛp^h]. When the two occur together, however, the phonetic shape is t^hei.tɛʔ]. The final consonant of *tape* disappears and the final consonant of *step* is reduced to [ʔ]. These changes can be seen as simplifications in the sense that they have been characteristic at an earlier stage of phonological development. That is, at an earlier stage these same words occurred without final consonants or with just [ʔ].

In the case of *finger.touch.* something similar happens, except that neither of these words occurs separately on this tape. In the analysis of Brenda's phonology for this tape I have concluded that there is a clear distinction between [pʰ] and [f]. For example, there are [pʰido] *Peter* and [pʰĩ] *pink* for [pʰ], and [fwai] *fly* and [faiĩŋ] *flying* for [f]. Developmentally the [pʰ] represents an earlier stage in places where the adult has [f]. In this construction, *finger.touch.*, the phonetic shape is [pʰiŋgə.tʰəč]. It appears that here is another example of the phonetic shape being reduced in some way to a less complex form with the addition of the complexity of construction.[1]

As a final example, in *read.page.* [ritʰ.peč] the initial consonant of *page* is the unaspirated [p], and in *pink car* [pʰĩka] the initial consonant of car is [k].

At first these constructions arose as problems in phonology. I was concerned with determining the "good" form and separating out the forms that appeared to be suffering from performance limitations. In these cases, however, the performance limitation could be described as the presence of the word in a larger construction. It was that larger construction that I found I had no means of describing. This study is the result of trying to make explicit the types of construction in which intonationally separate utterances fit.

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[1] See VIII.4, p. 198, for a discussion of another type of restriction in complexity.

To continue the narrative, I was still puzzling over problems of this sort when I recorded Brenda at age 1;10.17, tape (161-162). On this tape, which is the only data of BRENDA III, I found two-word sentences in abundance. In making the transcription I found that it was quite easy to distinguish these sentences from the earlier constructions I had been thinking about. In making the transcription I wrote them together on one line and gave them one utterance number. I then decided that the earlier constructions should not be classed together with these sentences since there were clearly two types of construction. This was the point at which I coined the terms "horizontal" and "vertical" constructions. The terminology came out of the format of my transcription with horizontal constructions being those sequences of two words which I grouped under one utterance number and vertical constructions being those sequences of two words which I grouped under separate utterance numbers.

VII.2 Horizontal Construction in BRENDA II

It was an accident of the layout of transcriptions that supplied both terminology and conceptual foundation for my thinking about constructions. I call sentences horizontal constructions and I call the other ones, for which the tradition had not given me a name, vertical constructions. In the first case, then, I have avoided using such terms as "sentence", "pivot-open", "telegraphic" and "two-word". In the second case I have invented a term that expresses the constructional nature of the utterances while keeping them separate from horizontal constructions.

Brown and Bellugi-Klima (1964, 1971, p. 307) made explicit the criterion for determining what I call horizontal constructions: when two words (or morphemes) are grouped together under the same primary stress terminal intonation contour they constitute a single utterance. In the terms of this study primary stress and terminal intonation contour are represented by FX intonation. Two more criteria can be mentioned, although they will have to be modified later. The first is the pause between the two morphemes. In horizontal constructions in BRENDA II, there were no pauses greater than 3/5 second. For the most part the pauses were even shorter. It should be noted that pauses of 3/5 second and under are difficult to time with any accuracy using a hand held stopwatch (cf. fn 1, p. 105). The meaning of these preceding statements, then, is that the pauses in horizontal constructions were too short to be timed accurately. In vertical constructions there was some variation ranging from one second to as much as eight seconds. These pauses which are more susceptible to being timed will be specified more clearly in the following discussion of vertical construction (VII.4, p.157). The point I am making here is that for horizontal construction the pause is minimal and can be clearly distinguished from that of vertical construction.

The other criterion that can be mentioned is that each of the morphemes must show independence. If no dependence can be demonstrated it is likely that the utterance in question is what might be called an idiom rather than a construction. That is, the child has simply memorized the whole without constructing it from its parts.

With these three criteria in mind for horizontal constructions I want to review the data of BRENDA II. Table 20 is a selection of various constructions found in BRENDA II.[1] Of these constructions only E5, E10 and E21 appear to be horizontal. The earliest, E5, is from (071) age 1;7.2. Just what it was intended to mean is difficult to say. It might consist of swim and boat. It does meet the three criteria to the limited extent that it is intelligible. I think it is best to consider this utterance marginal at most.

E10 and E21 hot water and pink car are both said with the primary stress terminal contour pattern. Both have a very short pause between them (under 3/5 second). In both cases the two words have been used independently in these and other sessions, which is a strong indication that they are true horizontal constructions. Of course, it is plausible that Brenda could have learned not only the free forms hot, water, pink, car but also the "constructed" forms hot water and pink car. I think that hot water is most likely learned as a whole, particularly considering that in the mother's Japanese hot water is a single morpheme oyu, and that on occasion she uses this word with the children.

The case of pink car is interesting since it does not occur just as that but rather as a type of build-up. To repeat the example, it is car.car.pink car. pink car.pink. This example appears to present the strongest case for horizontal construction in the data of BRENDA II. Curiously enough, it occurs within ten minutes of the end of the last tape (141).

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[1] There are many more. It is difficult, however, to say how many more since in addition to clear cases there are cases in which one or more but not all of the criteria are met.

VII.3 Vertical Construction in BRENDA II

The constructional nature of horizontal constructions has been well established in the literature (Braine 1963, 1971; Brown and Bellugi-Klima 1964, 1971; Miller and Ervin 1964, 1971), although the structural meaning is far from settled (Bloom 1970; Bowerman 1973; Brown 1973). I am going to assume that the reader accepts that horizontal constructions are genuine constructions and shall talk mostly about vertical constructions. To call something a construction we need some evidence that it didn't happen that way by accident. To link two or more utterances that are not linked by an intonational pattern, other evidence has to be considered.

I can describe four types of vertical construction in BRENDA II which I will call types A, B, C and D, in the order of the strength of the intentional linkage, type A being the most obvious construction and type D being the weakest case. These types of constructions and the evidence for them will now be discussed.

VII.3.1 Type A Vertical Construction

Type A, which is the last to develop, is very similar to horizontal construction. It consists of two one-word utterances in close succession with silence before and after. The words are linked in construction but not in intonational contour. By "linked" I mean that there is a definite semantic connection between the words that is appropriate to the context. The constructions of this type are almost all found in (141). Example E7 of Table 20 is the only instance of Type A vertical construction which is found earlier than the last session. The others are E13, E15, E17, E18, and E19. In E13, tape.step, the word order is the opposite of that expected on the basis of the ordering of horizontal constructions. (See Chapter VIII). Apparently word order in vertical construction is considerably more flexible than in horizontal construction. Since these constructions are so much like horizontal constructions, I think it is likely that they have been grouped together in some of the reported studies as "two-word" constructions. That would account for some of the earlier despair found, particularly in diary studies, over the lack of regular word ordering. (See for example Velten 1943, 1971, p. 89 who claims that syntax "begins with complete anarchy".)

VII.3.2 Type B Vertical Constructions

The second type of vertical construction, type B, which appears much earlier than type A, is like type A in that two words occur in sequence that show an appropriate semantic connection. These two types differ only in that in type B either word or both words may be repeated. The example quoted earlier of mama...shoe is of this type. It is clear from the context that Brenda is making the statement, "This is Mama's shoe". This is evidenced by the fact that after finally saying mama to her satisfaction she moves on the the second word. I have also pointed out the difficulty with which she does this. These two kinds of evidence indicate that she is making a construction.

In these two types of construction, types A and B, it is clear that Brenda is trying to say something beyond the limits of a single word utterance. It should be pointed out now that these two types are on a developmental continuum. What I mean is that the examples of type A are almost all found in the last session (141), whereas the type B constructions are found throughout the earlier sessions of BRENDA II.

Table 20 gives eight examples of type B vertical constructions: E1, E2, E3, E4, E5, E6, E14 and E20. From these examples and from the earlier discussion of phonological alterations in constructions it can be seen that the development of type B can be measured in terms of difficulty. First the difficulty shows up in the great number of repetitions and in the phonetic instability of the words used in construction. As Brenda's phonology and construction ability improve there are fewer repetitions and great stability in phonetic shape. Ultimately type B becomes type A when no repetition of the separate elements is necessary. Then the only indication of difficulty is that the phonetic shape suffers.

VII.3.3 Type C Vertical Construction

Existing in parallel with these two types of construction are two others which are not radically different. Type C constructions are like type A in that two words are linked semantically and without repetition. However, in these constructions the speech of another speaker intervenes. The second part of (3) above (VII.1, p. 144) is of this type. Brenda says, *something* in response to my asking, "What'd the cook say?" Whether or not her *something* should be understood to be in direct linkage with her earlier two words is difficult to say. It is certainly appropriate to my question. But, in turn, my question had the effect of asking for a constituent to fill out Brenda's construction.

Table 20 gives three examples of this type of construction: E8, E9 and E11. In E8 the mother could not make sense from Brenda's utterance, and simply asked her, "What about Kimby?" The case of E11 is similar. In both examples the other speakers have apparently taken Brenda's first utterance as the statement of a topic and have asked her to clarify it or comment on it. From the point of view of topic-comment construction the apparent lack of word order in vertical construction is not so disquieting. E13, mentioned above, (*tape. step*.) could well be described as a topic-comment construction.

The topic-comment type of structure is fairly common in the Hawaiian English of Brenda's father (Odo 1973). For example, he says "Diplomat that" (with "tag" or "defocused" intonation on *that*) in a context where Standard English would have something like *A real diplomat is what he is*. This indicates that for at least a part of Brenda's speech environment, topic-comment construction represents a mature form.

But rather than belabor the topic-comment point, I want to suggest here that this interaction with other speakers, as in these examples of type C constructions, may well be the means by which Brenda has learned how to construct in the first place.

VII.3.4 Type D Vertical Construction

As more evidence that interaction with other speakers is crucial to the development of vertical construction we can look at the fourth, and by far most common type, type D. These constructions amount to a combination of types B and C. That is, any of the words may be repeated and there is the intervention of other speakers. The tapes are literally full of interactions of this type. Some of them have rather shaky status as constructions in that the words appear to be simply the listing of separate elements of an object or a situation or, perhaps, a listing of a group of attributes. However, in many of these constructions (one of which is repeated from V.6.2, p. 119) it is evident that Brenda intended to go on to the second word but was simply waiting for verification from the listener that he had understood.

(5) (111)1 fẽĩ (B is looking at electric fan)
2 fæ̃
(M) Hm?
3 fæ̃
Bathroom?
4 fanĩ
5 faĩ
Fan! Yeah.
6 k^hu
Cool, yeah. Fan makes you cool.

In the case of types A and B, I described them as being on a continuum, with type A as the final development. The same can be said of types C and D, but with some qualification. As Brenda's phonology improves, and as the adults' understanding improves, the number of repetitions needed to get a response decreases. Again, examples of type C tend to be found in the later sessions, and examples of type D are found more frequently in the earlier sessions. The qualification that must be added is that there is really no clear distinction between vertical constructions in which another speaker intervenes and those in which there is no intervention. In many cases the intervention is simply an accidental simultaneity and no relation can be established. In many other cases there is a clear relation between what the other speaker says after Brenda's topic and what Brenda says in comment. But in some of these cases, at least, it is not clear that she would not have said the same thing anyway. Finally, in other cases it is clear that Brenda is only waiting for some indication that her first utterance was within some tolerance limits of understanding, after which she gets on with the construction.

VII.3.5 Relationship between the Four Types of Vertical Construction

Perhaps a diagram of these four types of vertical construction will be helpful. The four types can be cross classified on the dimensions of repetition and intervening discourse ("interlocution"). Type A, then, could be marked as [-repetition][-interlocution], type B marked as [+repetition][-interlocution], type C marked as [-repetition] [+interlocution], and type D marked as [+repetition][+interlocution]. The following diagram indicates this cross classification.

(6)

	[-interlocution]	[+interlocution]
[-repetition]	A	C
[+repetition]	B	D

Remember that the elimination of repetition in the production of vertical constructions is a later development. The freedom from dependency on interaction with another speaker is also a later development. These two facts operate to make the other types of construction eventually converge on type A as the culmination of a developmental trend.

VII.4 The Three Criteria for Construction

Now we can review vertical construction in general from the point of view of the three criteria for horizontal construction listed above (VII.2, p. 148). The first criterion was that the two morphemes be grouped under one sentence intonation contour. In vertical construction, each separate morpheme is given this pattern. They are separated from horizontal constructions by this criterion.

The second criterion is that there is either a short pause (under 3/5 second) or no pause between the two morphemes. In the selected vertical constructions of Table 20 the pauses are longer. In type A there is a range from one second (just one case) to 2 2/5 seconds (three cases). Type B varied from one second (one case) to 8 2/5 seconds (also one case) between the last token of the first series and the first token of the second series. Normally the pauses in type B were less than 3 1/5 seconds. Type C varied from 2 2/5 to 4 2/5 seconds. Type D constructions stayed within these ranges but were more variable.

Since these time lapses are somewhat inaccurately timed I think it is better to generalize by saying that for a construction to be classed as horizontal it must have a pause of less than 3/5 seconds, the lower threshold for timing. When the pause is between one and four seconds, a sequence is likely to be a vertical construction. When the pause is longer the constructional status becomes questionable.

The third criterion, that the separate morphemes occur independently, is somewhat strained in this context of vertical construction, since the other two criteria define the morphemes of a vertical construction as separate utterances to begin with. However, in many cases, such as _tall_ and _clown_, these words were used independently, as well as in the vertical construction. Their independence could be judged more or less objectively by the phonological stability of the forms.

There are several things that must be clarified about these criteria. In the first place it should be remembered that they have been applied _after_ making the judgment about the constructional nature of the utterances in question. That is, they are not the means of determining horizontal constructions, but rather an attempt to make explicit the intuitions of the investigator who made the initial judgment. In reapplying these criteria to vertical construction, I am making explicit the intuitions by which I have decided about these constructions.

From this it should be evident that these are not the only criteria that have been called into play in deciding about constructions.

There is a fourth and very important criterion which I have had to use. That is the criterion that the constructions have to "make sense" as constructions. To my knowledge this criterion has never been made explicit in previous discussions in the literature. It is, however, at the foundation of all the studies of early constructions. It is assumed that whatever is grouped together as a horizontal construction (that can be recognized by an adult as a horizontal construction) will make sense as a construction. I am arguing that this amounts to a fourth criterion that has been used for constructions. And I further argue that since it has been applied to horizontal construction, it should also be applied to vertical construction. It is this criterion that I am appealing to when I say above that when "two words occur in sequence that show an appropriate semantic connection" they are in vertical construction. It is because of my ultimate reliance on my own intuitions and my appeal to the reader's intuitions that I have ordered these four types of vertical construction "in the order of the strength of this intentional linkage, type A being the most obvious construction and type D being the weakest case."

VII.5 Vertical Construction in BRENDA I

In outlining the history of my understanding of vertical construction I said that at first I heard the vertical constructions of type A in tape (141) as horizontal constructions. It was only while making the transcription of (161-162), in which horizontal constructions appeared in abundance, that I realized that these earlier constructions were not the same. This led first to a re-examination of the constructions on tape (141). That, in turn, led to a re-examination of the full set of tapes that I have called BRENDA II (age 1;7.2 to 1;8.21). The result of that study was the classification of the four types discussed above.

Then it occurred to me that I might be able to find evidence for the beginnings of this construction even as early as BRENDA I. The earliest sequence of utterances that looks anything like this was in tape (031) when Brenda was 1;0.23. The situation is as follows:

```
(7)  (031)                (B is seated at the table in her high chair.
                           C's broken doll is on the table in front
                           of B)
                          (M)  What is that?
                               What is that?
                               What is that?
        53  a:la
                               What?  Hm?  What's that, Brenda?
                          (F)  What's that?
                          (M)  What's that?
        54  dau
```

The utterance 53 is an acceptable form of <u>Charlotte</u> for that period. 54 is <u>doll</u>. If we were to look only at this sequence of utterances, ignoring the adult speech, it would look like a type A construction, <u>Charlotte.doll</u>. And it was, in fact, Charlotte's doll. I am not going to suggest that Brenda has made this construction. What is interesting to me is how the interaction of the parents' repeated prompting and Brenda's own ideas had the cumulative effect of producing this sequence. For this reason I suggest that early interactions of this type might well provide the foundation on which the vertical constructions that come later in this period and, ultimately, horizontal constructions are built.

Three weeks later on tape (051) Brenda was reaching for Suzanne's necklace. She said:

(8) (051)6 nene
7 nene
8 avau

On the basis of decisions made about Brenda's phonology for this period we can say that she says two words here: <nene> ('nurture') and <awəu> ('I want'). The time lapse between 6 and 7 is 2 1/5 seconds; between 7 and 8 it is 1 4/5 seconds. It looks very much like a type B vertical construction. The problem is that it doesn't seem to mean anything.

Before discussing this in detail three more examples from the same tape will be given and then discussed together.

(9) (051) (Looking at food in picture magazine)
(M) Manman, uh huh.
58 məmæ
59 mɛmæ
(M) Yeah.
60 ava
(M) You want? Oh, can't eat from that.

(10) (051) (B picks up Daddy's magazine)
61 dædi
62 awau
(M) Hm? Oh, yes. That's for Daddy. Yes x x x for Daddy.

(11) (051)89 na (B empties juice from cup)
(R) What?
90 nau
(R) Now? No?
91 æwəu
(S) Allgone. [sic]
92 æwã

In (9) the first word <mæmə> ('solid food') is prompted by the mother. However, the <awəu> is spontaneous and taken by the mother to mean that Brenda wants the food she sees. That is, the mother takes the first word (or the picture) as a topic and the second word as a comment on that topic.

In (10) the meaning of the second word is not easily determined, but the meaning of the whole is taken again as some sort of comment on the magazine, not as an error of calling it by the wrong name. The same is true of (11) where, although there is no clear understanding on the part of the adults of what Brenda is saying, there is an understanding of the whole. That is, the cup is empty and Brenda wants more.

It should be seen from these four examples that they represent a very rudimentary sort of construction. In each case one of the words <nau>, <dædi>, <nene>, or <mæmə> was placed in position before <awəu>. It should be remembered that in the study of the phonology of this session these words represent the great majority of the words used at this time. Apparently the meaning of this construction is similar to that of a topic-comment construction. That is to say that first some object is mentioned by name and then commented on. It may be true that the best meaning for <awəu> is just that--'comment'. In some cases it is likely that the comment is suggested by the interaction as in type C and D vertical constructions.

The tentative nature of these constructions is seen in two ways. The first indication is that they are quite rare. It would be risky to attribute too much generality to a phenomenon that only occurred six times in BRENDA I. The second indication is that most of these constructions consist of some word plus <awəu>. This word, although very frequent in (051) and again in (052), (061) and (S11), has completely disappeared by BRENDA II, four months later.

VII.6 Summary of Vertical Construction in the "One-word" Period: BRENDA I and BRENDA II

Let us review the general development of vertical construction in the putative one-word period. It begins with highly tentative constructions in discourse that are cluttered with misunderstanding, repetitions, phonological distortions and other indicators of difficulty. With development, all of these problems are reduced. Other speakers respond to Brenda more frequently as her phonological control becomes more secure. This has the effect of requiring fewer repetitions to achieve the same end. Finally, Brenda arrives at the point where she can put two words together in sequence with only a distortion of phonetic shape and, perhaps, word order difficulty, although word order is generally consistent with later horizontal construction. She has arrived at the threshold of horizontal construction, not by miracle nor by accident, but by a fairly long process of active practice of construction in social interaction within her community.

VII.7 Construction in BRENDA III

I have said that my interest in the vertical construction of BRENDA II came out of a contrast of those constructions with the horizontal constructions in tape (161-162) at age 1;10.17. During the time that I was working out the developments described above, I continued looking at the horizontal constructions of BRENDA III.

VII.7.1 Horizontal Construction in BRENDA III

I have described the four criteria that are used in determining horizontal constructions: intonation contour, a pause under 3/5 seconds between the two morphemes, the independence of the two morphemes, and a semantically appropriate link between them. The first criterion, intonation contour, can stand without qualification, but the others need to be discussed.

The second criterion for horizontal constructions is that the elements are not separated by a significant time lapse. In BRENDA II the few horizontal constructions that were suggested had a lapse of 3/5 second or less between the separate elements. For the horizontal constructions of Table 21, 3/5 second is certainly a maximum, but for the most part there is no lapse at all but rather noticeable transitional features from one morpheme or constituent to the next.

Table 21 lists all of the horizontal constructions of (161-162). In many of the examples listed we can see that the words used also appear in Tables 7 and 8. That is, they are words which have been used independently in BRENDA II. In some cases, however, it is not true that they can be found earlier. For example, wash does not occur in BRENDA II. It does appear in (16 2). The full section on which wash clothing and wash clothes appears is as follows:

(12) (16 2)93 wash clothing
94 wash
95 wash
96 wash
97 wash clothes
98 wash clothes

As (12) shows, the word may not have actually appeared earlier or separately in my sample, but at the time does show a certain amount of independence.

A different item which is more difficult to explain is the it which appears in many constructions. This it is definitely not used as a separate morpheme here or elsewhere. In VIII.4 (p. 198) some evidence will be given that this it, rather than being the adult pronoun it, is more like a dummy symbol or perhaps in some cases a transitivizing particle, i.e., an inflection on the verb. Whatever its status may be, it will cause us to broaden somewhat the criterion that each word or morpheme in a horizontal construction must be used independently elsewhere before the whole will be accepted as a construction.

A second type of apparent exception in Table 21 will be taken up before returning to the broader criterion. Notice more coming out and Peach Boy coming out. These two examples raise the question of what is a word or morpheme for Brenda. More has been used independently for some time. Coming out is new on this tape. Peach Boy is an English version of Momotaro from the Japanese story of that name. It might legitimately be considered a single word. Since BRENDA II, however, she has used the word boy independently. Apparently Peach Boy and boy are similar to hot water and hot as discussed in BRENDA II (VII.2, p. 150). That is, for Brenda they are two separate words, the relationship between them as adults see it being non-existent for her.

From these two types of apparent exception to the "two-word" criterion we can see that it might, perhaps, be more accurate to speak of two constituents. By using "constituent" such a dependent form as it as well as such apparently complex forms as coming out can be treated as a single element in a two-element construction. In a two-constituent construction, however, at least one of the constituents must occur independently.

As far as the fourth criterion is concerned, a look at the horizontal constructions in Table 21 will show that these constructions are quite similar to those described by other investigators (Braine 1963, 1971; Miller and Ervin 1964, 1971; for earlier studies; and Bloom 1970; Bowerman 1973; or especially Brown 1973 for a recent review of the field). The discussion of the internal structure of constructions which is the basis for this fourth criterion is taken up in Chapter VIII.

The mean length of utterance (MLU) for (161-162) is 1.46 (See II.2.2.7, p. 23 for qualification). Based on this measure, Brenda can be seen to be in the very middle of what Brown has labelled Stage I, MLU 1.0 - MLU 2.0 (Brown 1973). Among the misrepresentations of this stage, perhaps the most glaring is expressed by Dale (1972, p. 40) when he refers to "two-word utterances" (horizontal, not vertical) as "the most common type of language at this stage." Table 22 gives a count of the one-word and two-word utterances (tokens) for (161) and a selected count for (162). Looking first at (161) we can see that the two-word utterances account for only 22.1 percent of the total. One-word utterances are 53.4 percent of the total. Of the 22.1 percent which are unintelligible but were transcribed, nothing can be said with certainty except that many were one syllable and therefore are not likely to be two morphemes, even in Brenda's system. The conclusion, of course, is simply that Dale is wrong.

The selected count of (162) may, perhaps, give an indication of how Dale's conclusion could have been reached. For (162) I selected all of the stretches of utterances that included horizontal constructions such as in (12) above (p. 165), the wash clothes example. If some one-word utterances were in close proximity, they were counted, otherwise they were not. With this kind of selection I got the figures for (162). Even with this kind of selection, horizontal construction accounts for only 47.4 percent of the total.

Of course, doing a little arithmetic with the mean of 1.46 would indicate that "two-word utterances" could not possibly be the "most common" type of language. That my figures are generally representative of this stage is borne out by Brown (1973, p. 138) who says that "in the 713 utterances of Adam I there are 202 which consist of two or more words." Presumably he is referring to tokens. The percentage that this gives is 28.3 percent compared to BRENDA III's 22.1 percent. Brown further reports that "from a corpus of 713 utterances Bowerman obtained 110 distinct combinations (types)." This gives a percentage of 15.4 percent. This can be compared to BRENDA III's 9.4 percent (types).

VII.7.2 Vertical Construction in BRENDA III

By now it should be clear that the horizontal constructions of BRENDA III compare favorably with those presented by other investigators for children at this stage of development. In my discussion of vertical construction in BRENDA II I said that Brenda had arrived at the threshold of horizontal construction and that this was by a process of active practice in construction. What is spectacular is that these processes of vertical construction do not lead into horizontal construction as into a dead end. When horizontal construction relieves vertical construction of the burden of two-word construction, the constructional possibilities are simply multiplied. The list of horizontal constructions of BRENDA III in Table 21 has been presented much as constructions of this kind have appeared in the published data on this period. What startled me was to place these horizontal constructions back into the context of the tape from which they were taken and discover the vertical constructions in which they function. Look at these:

(13)- (161)57 Brenda
58 see that

89 my turn
90 do it

(162) 5 bathtub
6 scrub it
7 scrub it
8 paper napkin

Table 23 gives a full list of the vertical constructions of BRENDA III (161-162). For some time investigators have lamented the fact that we have only performance data to look at. It has been said that what we need is some kind of evidence for the more complex structures that we feel the child must understand at this time, that the horizontal constructions imply knowledge of more elaborate constructional ability. For this child, Brenda, there is a great deal of evidence. Look at E1 and E2. The vertical construction in both cases produces subject-verb-object which is adult Standard English word order. Horizontal constructions imply that it is known. In vertical constructions it actually shows up in speech. In *my turn. do it* we even have a construction corresponding to the structurally complex adult form *It's my turn to do it*.

Notice that there are several varieties of vertical construction in Table 23. In fact, just the same varieties are present here as in the earlier period (BRENDA II). E1, E2, E3, E5, E10 and E13 correspond to type A in which the elements in construction are not repeated, and closely follow each other without the intervention of another speaker. Notice that now a vertical construction may have three elements and that any of those elements may be a horizontal construction. That is, when the single utterance limit went up from one morpheme to two morphemes, the limit on vertical constructions went from two to three elements. This suggests that later further expansion might take place.

The final point about this type A construction is that, as earlier, this type of vertical construction is the rarest. This is interesting in that these show the highest degree of complexity in terms of adult syntax. In the same way that finger.touch represented the highest point in the development of one-word vertical construction, Ron.make.tapecorder or my turn.do it may represent the highest point in the development of two-word horizontal component vertical construction.

The second type of vertical construction, type B, allows repetition of any of the elements. For example, E6 use it is repeated. E9 is also of this type. Again, there is a feeling of difficulty in performance that is surmounted by the technique of repetition.

Types C and D have another speaker intervening in discourse with Brenda. Notice in E6 and E7 that the speaker asked Brenda a question that prompted her response.

It is important to mention again that these examples were all taken from a single hour of tape. In this case we are not looking at a developmental history. All of these types are present during the same hour and I have no general indication of development for this period. By now, however, the continuity with the earlier period should be clear. Vertical construction is a phenomenon that develops during the pre-horizontal construction period and remains active at least well into this period.

One further point of continuity which will be taken up again in Chapter VIII.3.1 (p. 197) on the internal structure of these constructions is that many of these vertical constructions seem to be topic-comment structures. For instance, writing.writing.read dat was said while I was reading a story to Brenda that included a section where the boy in the story was learning to write. The meaning of Brenda's construction was 'read the part about writing', which was further evidenced by her leafing through the pages until she found that picture. These topic-comment constructions are, by far, the most plentiful of the vertical constructions in this sample. In retrospect, this type of construction can be seen to have developed in the interaction Brenda has had with other speakers. It is very tempting to think that vertical construction, which is first learned in discourse, ultimately remains at the foundation of the structure of discourse. I have tried to show that for this earliest period of horizontal construction there was a preceding period of vertical construction as preparation. Further, during the first period of horizontal construction, vertical construction remained active in producing the prototypes of longer horizontal constructions of later periods. This suggests, in fact, that discourse structure is at the heart of sentence structure from the beginning of its development.

CHAPTER VIII

The Structure of Constructions

VIII.1 How Can We Know Structure?

The question of just what it is we are describing when we describe a "child's language" has been brought up before. There is no part of the discussion where this problem is more central than here in the discussion of the internal structure of constructions. In the chapter before this (VII) it was fairly easy to talk about the external forms of construction. To begin with, in the early tapes an utterance could be defined as being bounded by silence. Later, but still in the early periods (BRENDA I and II), utterances could be defined by stress and falling intonation contour coupled with boundaries of silence. In these early periods "word" could be taken as equivalent to "utterance" without fear of serious misrepresentation.

The onset of horizontal construction produced a redefinition of utterance. That is, utterance was still defined as being bounded by silence and receiving primary stress and terminal contour, but it was no longer equivalent to "word". The definition of "word" was something like "former utterances". Words could be separated within horizontal constructions on the basis of their presence as single utterances in the preceding period. Vertical constructions could be defined on the basis of these other definitions, first as sequences of words and then as sequences of horizontal constructions.

The assumptions that have to be made are relatively few and, perhaps, innocent of misrepresentation. One assumes that silence does define utterance boundaries for the child. One further assumes that primary stress and terminal intonation contour have come to have the same meaning in the child's system as in the adult system.

VIII.1.1 Internal Structure

The problem of inferring the internal structure of utterances is not restricted to child language studies. Without going into the difficulties of distributional analysis of adult speech it should be mentioned that the approach of Braine (1963, 1971) appears to be modeled after such studies of adult speech as that of Fries (1952), in which an attempt is made to infer the internal structure of the utterances without reference to a speaker's intuitions about that structure. Of course, by now it is abundantly clear that Braine's attempt failed. It was only successful to the extent that he had removed from analysis conflicting forms. One of the major problems is, as Bloom (1970, p. 29) points out, that "there are no inflectional criteria for identifying major categories." She argues that in order to get

> evidence for constructing grammars for children's language it appears to be necessary to depend on the intuitions of a native speaker of the mature language for interpreting the semantic intention of what the child says (p. 9).

Bloom's major assumption is that it is

> possible to reach the semantics of children's sentences by considering nonlinguistic information from context and behavior in relation to linguistic performance (p. 10).

In order to break into the closed circle of the child's system Bloom has found it necessary to refer to her own linguistic system. Specifically she has done this by taking nouns to represent a "given" category. She says (p. 30)

> The feature [+N] was assigned to all lexical items that have noun status in the adult model. All lexical items, including nouns, were charted according to their occurrence in environments with nouns.

There is precedent for this procedure. For example, Brown and Bellugi-Klima (1964, 1971, p. 308) describe their method as follows:

> For many purposes we require a 'distributional analysis' of the speech of the child. To this end the child's utterances in a given transcription were cross classified and relisted under such headings as: 'A noun'; 'Noun-Verb; 'Verbs in the past'; 'Utterances containing the pronoun it'; etc. The categorized utterances expose the syntactic regularities of the child's speech.

In this case there was no attempt to restrict the number of "givens". All words were assumed to be susceptible to categorization within the adult system.

The extreme to which this type of categorization has been pushed can be seen best by referring to several of McNeill's publications. McNeill's 1970 book raises the question of how a child could have learned the basic grammatical categories. That the child has learned such things is simply asserted on the basis of his earlier publication, McNeill 1966. It is true that in McNeill 1966 he raises the question of what the status of such categories as noun and verb for the child might be. But to resolve the difficulty McNeill refers to the source quoted above, Brown and Bellugi-Klima, where we have seen that these categories were simply asserted in the process of transcription. While giving the appearance of dealing with the problem of "givens", McNeill pushed the resolution back onto earlier "work" which did not come to grips with the problem either.

VIII.1.2 Grammatical Categories in Child Language

Clearly, if grammatical categories are simply asserted for child language and then taken as being the primary data that a theory of language must explain, the circularity must be condemned. On the other hand, as a means of breaking into the child's system, a cautious use of "givens" which are based on adult intuitions can be justified.

In the first place it is clear that the child's utterances do communicate. I think it can be assumed that for communication to take place between the child's system and the adult's system there must be some non-trivial overlap. Brown (1973, p. 106) has recommended taking the "parental view". This recommendation amounts to making Bloom's assumption that if context is carefully considered one can understand some things about the child's system. That this is, in fact, the parental view is demonstrated in the following interaction between Brenda and her mother from (131) age 1;8.14.

(1) (131) (B is playing in the sandbox outside the house and there are quite a few flies around)
217 fai
218 fwə
(M) Yeah, a lot of flies. Go fishing with these flies. Catch your flies.

Whatever these two utterances were in Brenda's system the mother has taken them to be nouns (fly.fly) and relevant in the context as saying something about the abundance of flies. Further, she has immediately demonstrated the adult plural inflection for this category and given three sentence frames into which it can be put. In other words the "parental view" is to assume that Brenda has said a noun and act on that assumption.

It is still possible that Brenda's system is different from the adult's. But whatever else these utterances are in her system, they overlap with nouns in the adult system. The child's communication is dependent on this overlap and it is reasonable to assume that she will communicate to the extent that she accepts and, in turn, understands the parental view. The development of the child's words seems to indicate that this is what happens. By the time she begins horizontal construction the majority of the child's words may be classed as if they were adult words (to the extent that adult words can be successfully classed!) and the resulting word orders also fit the adult semantic system. Brown (1973, p. 145) refers to Bloom (1970) when he says

> the child's speech contains a certain kind of evidence that the relations are in his mind, and not just in the mind of the adult interpreter; the evidence of word order. The child acquiring English in a huge majority of cases orders his words as they should be ordered if the semantic relations suggested by context to adults are what he intends.

Of course this matching is somewhat guaranteed by the fact that the adult refers to the semantic context to infer word classes. For example, one of the difficult utterances that will be mentioned later is picture mark. What is in question is the correct category of mark.[1] Is Brenda saying that the picture will get marked or that the picture will get a mark? The inferred semantic structure depends on the word class and the word class depends on the semantic structure. If this had been, for instance, black mark the first word would be more easily classed as adjective and the second as noun. On the other hand something like pen mark would be more easily taken as a noun-verb construction.

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[1] In another context even the category of picture would be open to question.

What is the parental view in this case?

(2) (161) (B is holding some photographs carefully with both hands cupped under them)

208 picture mark
209 this
210 this
211 this way

(M) x x x make marks. Gotta hold it that way.

It is clear that the parental view is that mark is a noun. This raises the question of how to decide when the parental view is correct. A simple reference to the immediate context in this case isn't sufficient. I was present and took mark as a verb. Although this is a descriptive statement of what I did I think the reason I took mark as a verb is that I thought she was saying she was going to mark the picture (that is, by not holding it correctly). In this particular case, however, the mother has apparently drilled Brenda on the treatment of pictures and has said something of this sort to her before. Just what she has said on other occasions cannot be determined, but in the conflict between her intuition of Brenda's word class and mine in this case I would have to decide in favor of the mother's.

In most cases intuitions of word class can be made somewhat more reliably than this by simple reference to the context, as in this case it is difficult to consider picture a verb because of the context. I have presented a particularly difficult example so that the tentative nature of the use of "givens" (as in the case of mark) will be apparent.

I can conclude this discussion by saying that my approach has followed Bloom's. I feel that this technique of using "givens" is justified as long as one realizes that what is described is the communicative overlap between the two systems, not the child's own system, which remains inaccessible. In this context when I say that the child's system is developing I am referring to an increase in the overlap between the child's system and the adult system. This can be inferred from the increased ease with which the adult and the child can understand each other.

VIII.2 Structure of Horizontal Constructions

In this discussion I am going to look at the horizontal constructions of BRENDA III (161-162), age 1;10.17. Remember that this is one hour of tape which was taken at first only with the intention of providing a follow-up of BRENDA I and BRENDA II. Because of the relatively small amount of basic data that I have to work with I have applied no criterion of "productivity" such as that applied by Bloom (1972, p. 29). In general her approach of including only structures that occurred more than once would not work in such a narrow format at this. What is surprising, however, is the extent of agreement between the forms that have appeared in (161-162) and the forms reported by other investigators for children at the same period in their development (as summarized in Brown 1973, p. 66).

Table 21 lists all of the horizontal constructions of (161-162)--types not tokens. As a first approach I have listed them in groups on the basis of adult word classes. Within each group all of the forms fit into roughly the same patterns. I should also mention that in addition to these ten groups there are the isolated one-word utterances which might be said to form four other groups. On this tape the one-word utterances may be classified as nouns (e.g. Ron, mirror, T.V., snowman), verbs in a progressive form (e.g. turning, moving, singing), adjectives (e.g. ugly, blue, green) and negatives (e.g. no, don't).

The ten groups of Table 21 can be described as follows:

(3) Group 1: noun - verb. Notice that more in more coming out has been grouped as a noun here. Braine (1963, 1971) has more as a pivot. Schlesinger, as reported in Brown (1973, p. 114), includes more as an object (and presumably, therefore a noun). I have considered it to be a noun here by analogy with Peach Boy coming out.

Group 2: verb - $\left|\begin{array}{c}\text{noun}\\ \text{it}\end{array}\right|$. I have mentioned before (VII.7.1, p. 164; also see VIII.4, p. 198) that I think it here functions as an inflectional particle indicating transitivization of the verb. This is on the basis of the more or less complete lack of independence from the verb. However, by comparison with the other forms in this group it appears in the same position as the nouns and the pronouns dat, that, and this, for example, read dat and read it. This would indicate, perhaps, some rudimentary status as a pronoun for it. For these pronouns and it I am making no distinction between noun and pronoun.

Group 3: noun - noun. The difficulty of picture mark has been discussed above. Key lock is equally vague. Key is less doubtful than lock. The context is not helpful in this case. Brenda may either be speaking of putting the key in the lock or locking the door with the key.

Group 4: complex verbs. These are the separable verbs. Notice the number of cases in which it appears optionally between the two parts of the verb, e.g. bring home and bring it home. Notice also fill it up and fill up it in which it shows some independence. Finally, tree down and horn off are clearly exceptional, but I have grouped them here because of cut it down. This grouping will be discussed in VIII.4 (p. 198) below.

Group 5: noun - noun phrase (locative). The relationships between groups 5 and 6 will be taken up later (VIII.4, p. 198). Here I am tentatively considering here and dere to be NP's because they occupy the same position as the rudimentary NP on it.

Group 6: preposition - pronoun (locative)

Group 7: modifier - noun. Even for adult speech it is not clear to what class banana in banana leaf belongs. Brenda has used both words separately since BRENDA II as nouns. In this case, however, the first word stands in the relation of modifier to the second.

Group 8: pronoun (demonstrative) - noun. Only two of the four in this group literally fit this description: dis cat and this way.[1]

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[1] The orthographic contrast between d and th represents Brenda's variation between [d] and [ð].

Dat one cat appears to have expanded the demonstrative pronoun into a full NP. This is way was one instance in which the copula was inserted.

Group 9: noun - pronoun (quantifying). The reasons I have considered some to be a quantifier rather than a noun (see more above) are to keep these separate from Group 2 (noun - noun) and because this some has occurred regularly since BRENDA II with a quite rigid meaning of a quantity of something that Brenda gives to someone else.

Group 10: no restrictions. This includes idiomatic phrases such as thank you, and Brenda's longest single utterance, from (151) Santa Claus says Ho, Ho, Ho, Merry Christmas.

VIII.2.1 A Richer Interpretation

After the classification of utterances given in (3) above, the question remains of what it is worth. Perhaps it is interesting to see that a child of this age has the variety of constructions I have shown. However, without some demonstration that these different structures have a meaning that is different from that of the two words taken separately, not much has been said. Bloom (1970, p. 7) has pointed out that it is "necessary for grammars of child language to do more than just describe the surface constituents of sentences that can occur." Brown (1973), in reviewing the last decade of child language studies, notices that the general movement has been from distributional studies in the beginning to what he calls the "rich interpretation" of more current work. In the discussion that follows I am going to skip over the intermediate approach that would discuss the forms grouped above in terms of their "grammatical" structure. By this I mean that I am not going to be particularly concerned with the apparent fact that the constructions in Group 1 resemble adult sentences while those of Groups 6 and 7 resemble adult NP's. I will return to this type of analysis later (VIII.6, p. 207). What I am going to do now is take up Brown's prediction that studies of child language will confirm that at this stage of horizontal construction the child has control of three operations and a small set (around eight) of semantic relations.

VIII.2.2 The Three Operations

Brown (1973, p. 189-198) defines three operations and eight semantic relations which were found expressed in the language of stage I (MLU 1;0 - 2;0) children. The three operations he defines are nomination, recurrence and nonexistence.

Nomination is expressed when the referent of an utterance is "made manifest by some action calling attention to it for the members of the communicating group, usually a dyad"(p. 189). This can work from either direction. That is, the adult may point to something and ask "What's that?" The child's answer expresses nomination. From the other side of the dyad the child's utterances, such as this x or here x, when accompanied by pointing indicate nomination.

Brown refers to recurrence as it is demonstrated in Bloom's data by instances of more plus a noun or verb.

> The construction either comments on (declarative) or requests (imperative) 'recurrence' of a thing, person, or process. Recurrence itself means different things in different cases. It may mean the reappearance of the same referent already seen; it may mean the appearance of a new instance of a referent class of which one instance has already been seen, and it may mean an additional quantity (or 'helping') of some mass of which a first quantity has already been seen. (p. 190)

> Nonexistence expresses the opposite of recurrence.

> In very many cases, as terms like all gone and no more would suggest, the present nonexistent was quite recently existent in the reference context. (p. 192)

Brown suggests that "disappearance" might be more accurate than "nonexistence" in these cases. He points out, however, that "what is essential is an expectation of existence which the nonexistence sentence disappoints." (p. 192)

The presence of Brown's three operations, nomination, recurrence, and nonexistence can be easily confirmed from BRENDA III.

Dat one cat and dis cat exactly fit Brown's description of nomination. It is interesting that many of the single word utterances (that is, utterances which are in neither horizontal nor vertical construction) also are clear cases of nomination. For example, Brenda was looking into the cassette tape recorder which has a clear plastic door. At first she was watching the tape turn but then suddenly said, mirror! Her loud voice indicated to me her surprise at the discovery of the reflecting properties of the plastic. Nomination of this sort is frequent and the easiest of these operations to establish. Some of the utterances of Group 7 were also of this type. For example, icy juicy was said as Brenda looked into a glass of juice with ice that her mother had just given her.

Recurrence is expressed in more coming out. In addition to this it appears that many of the progressive form verbs that stand alone are expressing recurrence. I have mentioned singing, moving, and turning above (p. 179). I think it is the progressive or continuing state that Brenda is noticing here. For example, for a few minutes Brenda watches the turning of the tape cassette reels and says moving. (2x), turning. (3x), turning around., moving. (2x), singing. (3x), and moving. (4x). It appears to be the continuation (recurrence) of the motion that she is commenting on.

The use of hiding indicates nonexistence for Brenda. In the examples of hiding in Table 21 Brenda was looking at photographs in which many members of her extended family were present. It was while looking at just those photographs in which she didn't appear that she said, hiding Brenda. Hiding Halet was then said of Charlotte for one photograph in which Charlotte didn't appear. Brenda is commenting on the absence of the person expected.

VIII.2.3 The Semantic Relations

Brown gives eight relations as the basic core of semantic relations (p. 193 - 198). Theyare

(4) (1) agent and action
    (2) action and object
    (3) agent and object
    (4) action and locative
    (5) entity and locative
    (6) possessor and possession

(7) entity and attribute

(8) demonstrative and entity

Before discussing these eight semantic relations there is one concept that I feel needs specific mention. That is the concept of "agent". In general, agents are taken to have the feature of [+animate] (e.g. Fillmore, 1968). This feature has been applied by reference to the investigator's own feelings about what is animate and what is inanimate. What I want to point out is that it is difficult to say what the animate/inanimate distinction might mean for a child. Piaget (1969, p. 229) has said that "the child's thought begins with a lack of differentiation between living and inert bodies." In another place he says that in the first stage (age 4 to 6;7)

> all things are conscious--the child in this stage certainly never says that everything is conscious. He simply says that any object may be the seat of consciousness at a given moment, that is to say when the object displays a particular measure of activity or is the seat of some action. (p. 174)

It is probably true, then, that Brenda at 1;10.17 does not make any distinction between animate and inanimate or conscious and non-conscious. For this reason it is likely that for her "agent" and "object" are probably not distinguished on the basis of the feature [animate]. I am following Brown's (and Chafe 1970) usage in not requiring this distinction for agents.

I should also point out that the three operations are not distinct from the eight semantic relations as a separate set of utterances. That is, an utterance which expresses one of the semantic relations may also express one of the operations. For example, the two utterances dat one cat and dis cat both express nomination (an operation) as well as demonstrative and entity (a semantic relation).

The groups of Table 21 can be matched up with Brown's eight semantic relations as follows:

(5) (1) agent and action: Group 1. If we remember that agent is not strictly animate the inclusion of more and corder as agents is not particularly incongruent.

(2) action and object: Group 2. Some of these are less clearly objects than others. I have included it as an object. Considering see, hiding and have as actions in relation to objects is also somewhat strained.

(3) agent and object: Group 3. Picture mark is certainly not expressing this relation. That is, it is very difficult to imagine that Brenda is saying the picture has instigated some action which has resulted or will result in the mark. Key lock may or may not be in this relation. It could only be expressing this relation if she meant that the key had done something to the lock, which seems rather farfetched. On the whole I feel that I have no examples of this relation.

(4) action and locative: Group 4. Some of the constructions in this group may be of this type. For example, bring home and bring it home through the structure of a separable verb seem to indicate both the action and movement toward a location. There are others, such as leave it on and put it on, for which locative does not seem to be

too strong a classification. However, such complex verbs as *fill up* and *cut it down* are more indicative, for me, of the finished state of the main verb than location. For me, to fill up means to fill until it cannot be filled any further, not fill toward the top. I can only guess what they might mean for Brenda. The isomorphy of *up* in *fill up* with *up* in such adult utterances as *come up* and *climb up* may mean that for Brenda they are in some way locative.

One further note on these complex verbs. If the two parts of the separable verb indicate an action and locative relationship, there is still room in this construction for an optional *it* which may indicate object as well. The variation between noun and *it* which has been mentioned before will be discussed in more detail below.

(5) entity and locative: Groups 5 and 6. The examples of group 5 have a clear entity stated, i.e. *who*, *Brenda*, and *water.* In these the locative is expressed by *dere*, *here* and the noun phrase *on it*. Group 6 constructions do not have any entity expressed but are full noun phrases. As I will try to show later, at least in one case this entity is expressed in vertical construction, i.e. *tapecorder*. *in there*. The relationship between these two groups will be discussed below as having to do with the two constituent limit on horizontal construction.

(6) possessor and possession: Group 3. In this case *key lock* can be definitely excluded as expressing this relation. *Picture mark* is probably of this type. That is to say, it is not unreasonable to

think that this construction means that the picture will have a mark (if not treated properly). It is the only example in (161-162) that may be of this relation.

(7) entity and attribute: Group 7. To the extent that items in this group are genuine constructions they all may be considered to express this relation. I have expressed doubts before about the constructional status of some of these. Although *tape* and *corder* are both used separately in this session it is still not obvious that *tape corder* is not a third word. The same is true of *banana leaf* and *paper napkin*. Only two of Group 7 *scary monster* and *icy juicy* are very probably constructions of this type.

(8) demonstrative and entity: Group 8. In one case the demonstrative has been expanded to a full noun phrase--*dat one*. In the other case the copula has been inserted between the two elements of the relation.

This covers the eight basic relations that Brown has suggested. He does not claim that these are the only eight relations nor that all of these invariably occur. In addition to this list of eight are several others which have at least marginal status. I have evidence for at least two of these.

(9) indirect object dative: Group 9. There is only one example of this structure on this tape (161-162). Several days earlier (151-152) Brenda used this construction extensively but always with a

regular meaning. In all of the other cases the construction was proper noun - *some*. The meaning was 'I am giving some of this to X'. As I will point out below the object in this construction occurs in vertical construction, e.g. *rotten.food.dog some*.

(10) instrumental: Group 3. One analysis of *key lock* would have *key* as an instrument and *lock* as an action. This is the only case, and since I have mentioned this example in several other relations it should be clear that its status is, at best, quite tentative.

Finally there are the forms of Group 10 which are apparently unrestricted and include idiomatic phrases and memorized performances such as the Santa Claus quote mentioned above (p. 181). It should be noted, however, that this unrestricted miscellany does not include any utterances simply because they are problematic for the analysis above. That is, I have not used this miscellany as a means of getting rid of difficult cases.

VIII.2.4 Summary

To conclude this review of Brown's three operations and eight semantic relations I can say that there is a fair correspondence between his predictions and my data. In some of the cases the relationships have been quite clear, but in others it has been difficult to make decisions about the correct classification of an utterance. The groups of Table 21 were originally grouped on the basis of the similarity of the internal structuring of the order of word classes. I have shown that, in general, these internal structures express distinct semantic relations. I say "in general" because several of these groups do not seem to have any one semantic structure associated with them. For example, Group 3 (noun - noun) structures are difficult to be certain about in the first place, and do not, as a group, express a single relation. At the other extreme two groups, 5 and 6, seem to be collapsible in the expression of one relation--entity and locative.

The result is that there is not always a one-to-one correspondence between the expressive means and the expressed relation. It is also interesting that the cases which are easiest to classify happen to have word orders that correspond to adult surface orders. The noun - verb constructions are easy to understand as agent and object relations. On the other hand, noun - noun constructions are not responsive to a neat analysis. This should signal to us again that we are studying the overlap between the child's system and the adult's system. On the one hand there is evidence that the child is using some of the same expressive means as the adult. The evidence for this is that so many of the child's utterances fit fairly easily into the adult classifications. On the other hand the lack of total fit indicates both that the child's system is not isomorphic with the adult's and that our intuitions about the adult's system may not be correct either.

To recapitulate, then, I have found quite clear evidence for Brown's three operations--nomination, recurrence, and nonexistence. For the basic semantic relations I have found the following:

(6) (1) agent and action: strong evidence.

(2) action and object: strong evidence.

(3) agent and object: probably not present.

(4) action and locative: moderate evidence.

(5) entity and locative: good evidence.

(6) possessor and possession: probably present, but the evidence is one weak case.

(7) entity and attribute: moderate evidence.

(8) demonstrative and entity: moderate evidence.

(9) indirect object dative: one good example.

(10) instrumental: only one doubtful example.

(11) unrestricted: several examples.

Considering the limited sample on which this part of my analysis is based (one hour with around 600 total utterances)[1] I feel that Brown's predictions are strongly confirmed. That is, most of the relations he claims are present. The ones which are not present may have been excluded by the narrow limits of the sample. On the other hand the evidence for relations other than those mentioned by Brown is weak. Generally speaking Brown's operations and relations appear to be an appropriate categorization of the horizontal constructions in my data. In a confirmation of this sort, however, I want to recall that we are looking at the overlap of two linguistic systems, Brenda's and mine. What I am confirming is not necessarily that Brenda's system fits this characterization but that my understanding of Brenda's system fits with the understanding other investigators have had of the systems they have studied. I believe that this is certainly indicative of some characteristics of the child's own system but not that this description is the child's system.

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[1] But compare this with data summarized in Brown (1973, p. 65 - 74). Brown used 713 utterances each for the "grammars" written for Adam, Eve, and Sarah. Boverman also used 713 utterances as her data base for a "grammar". Braine used 293 utterances and Miller and Ervin used 450. Bloom's "grammars" are based on totals as follows: Eric I, 19; Eric II, 87; Gia I, 141; Kathryn I, 397; Gia II, 141; and Eric III, 263.

VIII.3 Structure of Vertical Constructions

Bloom (1972, p. 25) makes the following mention of what I call vertical construction:

> It is of considerable interest that just before the emergence of syntax in their speech, Gia, Eric, Allison, and Leopold's Hildegard were able to produce related one-word utterances in succession, but without underlying grammatical relationship between the forms.

In Chapter VII I have claimed that there is a relationship between the forms which make up vertical constructions, and that this relationship can be seen to be grammatical. In his discussion of longer sentences Brown (1973, p. 187) concludes that more complex sentences (e.g. Adam hit ball) can be seen as combinations of the elements Adam hit and hit ball. He further claims that the child has to learn to do this. The claim I make is that vertical construction is the process by which he learns to do this. In the discussion that follows I intend to show how the separate structures of horizontal construction combine to produce structures of greater length and complexity.

Table 23 lists all of the vertical constructions of (161-162). Again as an approach we can list forms on the basis of word classes and Brown's semantic relations. For horizontal constructions I found ten types of word class structures:

(7) (1) noun - verb
    (2) verb - $\left|\begin{matrix}\text{noun}\\ \underline{\text{it}}\end{matrix}\right|$
    (3) noun - noun
    (4) complex verbs
    (5) noun - noun phrase (locative)
    (6) preposition - pronoun (locative)
    (7) modifier - noun
    (8) pronoun (demonstrative) - noun
    (9) noun - pronoun (quantifying)
    (10) unrestricted

In addition to the ten types of horizontal constructions above there were four single word types: noun, verb, adjective, and negative.

The following types of vertical construction can be found in Table 23. Examples are given in the same order as in Table 23.

(8)	(1)	noun	agent
		verb - noun	action and object
	(2)	noun	agent
		verb	action
		modifier - noun	entity and attribute
	(3)	modifier - noun	entity and attribute
		verb - noun	action and object

(4)	pronoun (demonstrative) - noun	demonstrative and entity
	verb - noun	action and object
	verb	?
(5)	modifier - noun	entity and attribute
	preposition - pronoun (locative)	entity and locative
(6)	modifier - noun	entity and attribute
	verb - noun	action and object
(7)	verb	action
	noun - verb	agent and action
	noun - verb	agent and action
(8)	modifier - noun	entity and attribute
	verb - noun	action and object
(9)	noun	object
	verb - noun	action and object
	modifier - noun	entity and attribute
(10)	noun	object
	complex verb	action and locative
(11)	verb	object
	verb - noun	action and object

This is only a partial list of the vertical constructions of Table 23 but it will serve to illustrate several problems. First it should be noticed that with the exception of (7) the same type of horizontal construction does not appear more than once in any vertical construction. (7) is a very weak case of vertical construction. It appears to be more a pattern drill of some kind than a construction. On the other hand I should point out that it is just because two horizontal constructions of the same type appear in sequence that this does not seem to be much of a construction. My inclination is to believe that the prohibition of two horizontal constructions of the same type within a single vertical construction is a characteristic of the child's system but I have included (7) in the list of vertical constructions to keep the data honest even if it makes it difficult to generalize the dissimilar element restriction.[1]

In the first example it seems clear from the context of the action and object construction with which it forms a vertical construction that the single noun Brenda is an agent (Brenda. see that) The second example, Ron.make.tape corder, gives a structure of agent and action and object. But this example raises a problem. When taken by itself the modifier - noun horizontal construction was seen to express the entity and attribute semantic relation. Now in this construction it can be seen to actually be in the relation of object to the single-word agent and action. The problem that this raises is that when examined as horizontal construction one semantic relation is expressed, whereas in vertical construction a different relation is expressed. Apparently these semantic relations can exist within higher sets of semantic relations. How can one be sure that the classification ascribed to a construction is at the proper level?

Since this problem has come up with the entity and attribute relation in tape corder, let us look at more of these entity and attribute relations. (2), (3), (5), (6), (8), and (9) include horizontal constructions of this type. In (2), as I have said, the construction functions in the relation of object to the whole. In

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[1] In this I am acknowledging the importance of Labov's call to remain true to the data in spite of theoretical difficulties. (Labov 1970;1971)

(3). my turn.do it, it is not clear what the relation of my turn to do it is except that it is not object. It may be agent. In (5), tape corder.in there, tape corder functions as entity in relation to locative. (6), tape corder.use it (2x), and (8), banana leaf.(2x) pick it (6x), are like (2) in that entity and attribute function as object in the whole. In (9), bathtub.scrub it. (2x)paper napkin, the entity and attribute paper napkin as a whole is instrumental in the vertical construction.

A second observation is that this confusion of levels only seems to happen for one other of the basic semantic relations. Above I somewhat tentatively grouped in there and on dere[1] with entity and locative. In (5) in there occurs in construction with tape corder. It seems clear that when there is an "entity" expressed in vertical construction it is not expressed in the horizontal locative construction. Only when the "entity" is within the same horizontal construction as in Brenda here, is it really an entity and locative construction. Otherwise it is simply a locative noun phrase.

It is peculiar that the two pairs of relations, entity and attribute and entity and locative, may function as single elements in a higher level semantic relation (e.g. entity and attribute becomes object in an agent - action - object construction in Ron.make.tape corder). It is because I want to suggest this hierarchical structure that I have used "noun phrase".

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[1] The contrast th/d is used to orthographically indicate a [ð]/[d] contrast.

VIII.3.1 Topic-Comment Constructions

There are two general types of vertical constructions in Table 23. The first type has adult English word order, e.g., E1, Brenda.see that, E2, Ron.make.tape corder, and E3, my turn.do it. For these there seems to be a general principle of non-redundancy operating. That is, a relation does not occur twice in the same construction. This is in keeping with Fillmore's (1968) general restriction on cases, that within one sentence no case can appear more than once.

The second type of vertical construction has just this prohibited redundancy. Notice that in Table 23 in some cases one case relation, object, occurs twice, for example E11, writing.(2x) read dat. E6, E9, E10, E12, E13, E14 and others are also examples of this. Bloom (1972, p. 24) has said about constructions of this type that

> a structural description of these utterances in terms of Topic and Comment as the basic grammatical relation of (the) surface structure of the constituents (Chomsky, 1965, p. 221) would be appropriate.

Bloom says further (p. 25) that

> at this stage, when children produce utterances with the surface features of Topic and Comment, they do not use the syntax of the adult model, and there is no evidence from their linguistic performance that they 'know' the syntax in the sense of being able to use it.

To be fair I should make clear that Bloom was referring to an earlier stage of development (corresponding to BRENDA II).

The point I wish to make is that many of the vertical constructions of this period can be described as Topic-Comment constructions. They can be more explicitly described as constructions of the form:

object/action (writing/read) plus object (dat) in which the object (writing, i.e. 'the part about writing') occurs twice in the construction.

The abundance of these forms in this hour of tape and their productivity lead me to question Bloom's assertion that "there is no evidence from their linguistic performance that they 'know' the syntax." Gruber (1967, 1971, p. 343) makes a fairly strong case for Topic-Comment structures but then, unfortunately, assumes that because they are not present in the parents' speech they must represent some innate ability of the child. First I should point out that Topic-Comment constructions are present in Brenda's parents' speech. But even in the cases where these constructions are not present in the adult speech I suggest that they are learned by the child not in imitation of the adult but rather in interactions with adults.

VIII.4 Constraint on Length: "Natural Syntax"

Brown and Bellugi-Klima (1964, 1971 p. 310) observed that their children "were operating under some constraint of length or span." They further suggest that "the constraint is a limitation on the length of utterance the children are able to program or plan." Bloom (1970) observed that "the affirmative sentence was reduced with the operation of negation." (p. 169) She further points out

> The number of syntactic operations or the complexity of grammatical relationships within a sentence appears to increase the cognitive weight of the sentence for the child, and his reduced utterance reflects the inability to carry the full sentence load in performance.

More recently Brown (1973, p. 184) has said

> Sentence complexity limits in Stage I may be stated in terms of the number of elementary relations that may be programmed into a single sentence.

This overall constraint on the length of an utterance is observable in the data I have offered. An examination of this phenomenon shows some interesting results. The explanation for this constraint that comes to mind is that a young child simply doesn't have any more complex underlying structure than that expressed, and the length of the surface forms must wait on this cognitive development. The vertical constructions, however, indicate that in some cases, at least, Brenda does have in mind a larger structure than that which can be said in one utterance. This evidence from vertical constructions indicates that on horizontal constructions there may be some natural limitations that can be compared to those proposed in phonology by Stampe (1969) and Smith (1973). That is, there may be a natural limitation on the length of utterances. This limitation is suppressed with development so that constructions which were only possible vertically, i.e., with pauses, later become possible horizontally. Gregory Lee (personal communication) has suggested that this successive lifting of length restrictions be called "natural syntax" after Stampe's "natural phonology".

If there is a natural limitation on length, then there should be cases where under certain conditions that limit can be lifted, as in phonology where if there is an immediate model of the word, the pronunciation can be somewhat advanced over that normally found for that stage. Or in some cases we should see evidence of improvement with practice over several repetitions. As we will now see, in construction there are cases of several phenomena which do indicate a natural limitation.

Two of the several cases of longer than two-word horizontal constructions appear to be simply innovative, i.e. *Brenda read now* and *now read it*. Also *more coming out* and *Peach Boy coming out* have been discussed above as not being real violations if a constituent may include such complex proper nouns as *Peach Boy*.

There are several cases where Brenda builds up a longer form over several repetitions. The last time the *this way* sequence appears it is *this [ɪ] way*. There is apparently an attempt to insert a copula between the two elements.

A clearer case yet is that of *like that* followed by *like that song*. In this case Brenda does manage to include a full noun phrase in an action and object structure.

The most noticeable examples of the two word, or constituent, limit have to do with the use of *it*. There are many cases in which a complex verb occurs first without *it* and then with *it* between the two elements, e.g. *take home.take it home*, *fill up.fill it up*.

This latter example, if expanded, will show more clearly how these sequences are built. There are four "uses" of *fill up* sequences. They are as follows:

(9) (1) fill up
fill it up (3x)
fill up

(2) fill up
fill [ə] up

(3) fill up (2x)
fill it up

(4) fill up
fill up [ə]
fill up it (2x)
fill up

(5) fill up

In every case the short form *fill up* occurs first. When *it* is inserted, apparently it is practiced, for example in (1). The [ə] in (2) indicates that Brenda does not have full control over the insertion of *it*. The [ə] in the final position in (4) followed by two instances of *it* in this position indicates that it took practice to perform this postpositioning of *it*. It is because this postpositioning of *it* comes after eleven instances of *fill up* or *fill it up* that I have considered this form to represent postpositioning. That is, I have considered *fill up* to be basic, *fill it up* secondary, and *fill up it* a development of *fill it up*.

In action and object structures the classification of *it* is somewhat difficult. In some cases, such as the many verb-it constructions, *it* seems to have the status of a full word; in others, if the two word limit holds, *it* does not have full word status. This is the reason for suggesting that *it* is an inflectional particle of some kind that represents the place of a longer element that becomes impossible for the child to include in the utterance because of the two element limit.

There are several good examples of the interaction between the two word limit and *it*. We have *cut it down* and *tree down* (an apparent exception to the action and object word order, verb - noun). The meaning from the gesture, which was a strong cutting motion, was that Momotaro (Peach Boy) had cut the tree down. A second example *horn off* was said about a picture in which Momotaro had cut the horns off several monsters.

The solution to these apparent exceptions and to the question of the status of *it* can be seen if we consider the underlying form of all the complex verb structures to be verb - noun - verb affix. In the case where the noun appears (as in *tree down*) the verb does not appear. In cases where the noun does not appear it is optionally zero or represented by *it*, the transitivizing particle.

There is some evidence from one of the other structures to indicate that this is the correct solution. In the Group 5 and 6 structures (locative), we see that they may be the same structure, but in combination one or the other of the elements is optional. When the structure occurs by itself it is a locative noun phrase consisting of preposition - locative, e.g. *in dere*. However, in the entity and locative structure either the preposition is not chosen, as in *Brenda here*, or the locative becomes *it*, as in *water on it*.

The cases presented here indicate that there is constraint on the length of horizontal construction. Vertical construction, in contrast does not appear to be closely constrained. Evidence for the eliminated parts of horizontal constructions can be found by looking at vertical constructions in which those elements actually appear.

VIII.5 Vertical Construction in the One-Word Period: BRENDA I and BRENDA II

In a BRENDA III vertical construction such as Brenda. see that. it is not difficult to argue that Brenda stands in relation of agent to the rest of the construction. The structure of vertical constructions in BRENDA II can be understood in the same way but with some qualifications. First, one of the reasons that Brenda can be understood as an agent so easily is the reasonably clear horizontal construction that follows. When horizontal constructions are of one morpheme length there is no internal structure to refer to in the longer vertical construction. In addition, word class intuitions are much more uncertain. The intuition of a word class is strongly dependent on the adjacent words in a horizontal construction. For example, picture mark above is difficult. If it was red mark or dirty mark it would be easier to consider mark a noun. On the other hand if it was pen mark the intuition that mark was a verb would be stronger. In one-word constituent vertical constructions word classes are more difficult to determine and the result is that the structure must also be difficult to determine.

With these cautions in mind we can see the following relations in the vertical constructions of Table 20:

(10) (1) noun - verb: Examples E5, E7, E8, E9, E12, E16, and E18. In all of these the semantic relation expressed is agent and action. E16 has an object added with prompting.

(2) verb - noun: E15 and E17. The semantic relation expressed is action and object.

(3) modifier - noun: E10, E21 and E6. The semantic relation is that of entity and attribute. Remember, however, the question raised earlier about the constructional status of these examples.

(4) noun - noun: E2, E3 and E4. These examples all express the possessor and possession relation.

(5) locative - noun: E14. This expresses the entity and locative relation.

It should be noticed that all of these except (5) are in the same word order as that found for horizontal construction in (161-162). In (3) there was also one case of the reversed order (noun - modifier). In the case of (2) there were two examples of the reversed order (noun - verb) indicating the same action and object relation.

In the case of words which stand alone--that is, not in vertical construction--I will not make any argument. These words are all listed in Tables 7 and 8. There are two words, however, which stand alone and yet clearly indicate semantic relationships: some and share. Some is always used to express a type of dative (benefactive?) in which Brenda gives something to someone else. Share is used in the reverse case when someone else is exhorted by Brenda to give something to her. This is borne out by the fact that as soon as the one-word limit is lifted these constructions occur with the recipient expressed, as in dog some of (161).

VIII.5.1 The Three Operations and Basic Semantic Relations in BRENDA II

From the examples given above it should be clear that many of the basic relations are present in vertical constructions in BRENDA II. Although the word order is not fully regular, there is a high degree of regularity. It is apparent that even as early as BRENDA II the use of word order to express semantic relations is beginning to develop.

There is a fair amount of evidence for Brown's three operations: nomination, recurrence, and nonexistence. The two most common words in the data of BRENDA II are Brenda and Mommy, and in some of the cases in which they are used they are clearly naming. Of course, there are many other words which are used in the discourse frame of nomination. That is, another speaker asks for nomination by saying, "What's that?" Brenda's word in response can at least tentatively be considered a nomination.

Recurrence is indicated by the frequent use of more as well as, perhaps, my turn. Brenda often used my turn when she was doing something like drawing with a pencil and Charlotte took it away from her. In this context my turn could mean 'I want to do more drawing' or 'give it back', both of which seem to be indicating some kind of recurrence.

Nonexistence is indicated throughout BRENDA II by the use of no more and hiding. The continuity with BRENDA III can be seen in the use of hiding in both periods.

As far as the eight basic relations are concerned they are summarized for BRENDA II as follows:

(11) (1) agent and action: strong evidence.

(2) action and object: good evidence.

(3) agent and object: no examples.

(4) action and locative: no examples.

(5) entity and locative: one example.

(6) possessor and possession: good evidence.

(7) entity and attribute: evidence depends on analysis of these earliest horizontal constructions.

(8) demonstrative and entity: no examples.

Also present are the one-word relations:

(9) benefactive: good evidence.

(10) dative: good evidence.

Once again it can be noted that the strongest case can be made for (1) agent and action. I suggested before that there may be something special about the constructions that in adult language are realized as noun phrases. Notice that (7) is the group about which there was some doubt concerning their constructional status. I suggested that they may be simply learned as unanalysed wholes, e.g. hot water rather than 'water which is hot'. Whatever the resolution to this problem may be, it is interesting that the semantic relations that are expressed by noun - verb and noun phrase in adult English are among these earliest relations expressed in construction.

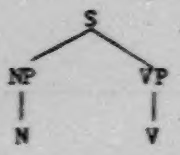
VIII.5.2 Evidence from BRENDA I

It becomes rather farfetched to look for these semantic relations as early as BRENDA I. There is evidence, however, for the three operations. It should be remembered that there were words such as <nene> and <dædi> which seemed to function as names. On the other hand, some of the suggested meanings for the most common word, <awəu> indicated recurrence. The mother sometimes thought it meant 'again'. And, finally, in tape (051) Brenda finished drinking a cup of juice, looked into the empty cup and said, <nau> twice. The meaning of this is apparently that the juice is gone (i.e. nonexistent).

VIII.6 Transformational Approach to Horizontal Constructions

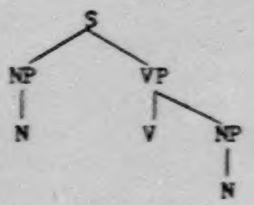
In VIII.2.1 (p. 181) I promised that I would return to discuss an intermediate position between the earlier distributional studies and the recent "rich interpretation" studies. The position to which I refer is that taken by Bloom (1970). The earlier studies assumed no structure other than that which was immediately observable in the child's utterances. On the other extreme, the "rich interpretation" assumes semantic structures which are observable, if observable at all, not only in the child's utterances but in the context of those utterances. Although Bloom has provided much of the impetus toward "rich interpretation" studies her 1970 position was generally that of transformational generative grammar. That is, she assumed complex underlying syntactic forms which were related to surface forms by means of transformations. Bloom suggested a reduction transformation as a means of producing simpler surface forms from more complex underlying forms. Using this type of approach, if we look at a few of the horizontal constructions presented in Table 21 we could describe them (roughly) as follows:

(12) Group 1: e.g. Ron talk



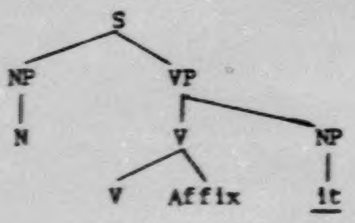
No transformations are needed to produce surface form.

Group 2: e.g. drink soup



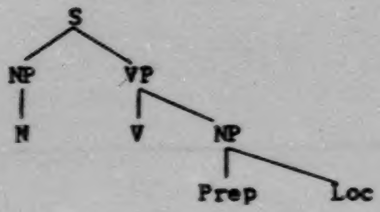
A reduction transformation is needed to produce surface form in which the subject N is deleted.

Group 4: e.g. bring it home



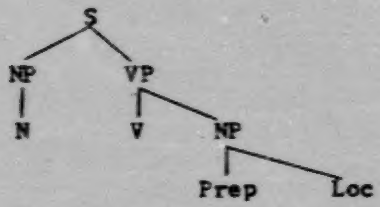
Subject N deletion as well as affix reordering transformation is required.

Group 5: e.g. Brenda here



Transformation needed to delete surface verb.

Group 6: e.g. on dere



Two transformations are needed--one to delete the subject N, the other to delete the verb.

By now it is fairly clear that virtually all of these transformations are phrased as deletions on the surface of something that is taken to be present in some underlying form. Is it not strange that at its most fundamental level the structure of a sentence is best described by what is not present? I suggest the reason for this is that the structures represented above do not correspond to any psychological reality for the child but rather to a convenient analysis for the investigator. My reason for suggesting this is that those very things which have to be deleted above are often actually present, on the surface, in the form of vertical constructions.

Look at examples E1 through E5 in Table 23. In E1, Brenda.seethat, the reduction transformation would delete the subject noun (Brenda) if it was treated as a horizontal construction alone. However, if the vertical construction is considered, this type of analysis could hardly explain the presence of that very subject on the surface. E2, Ron.make.tape corder, being a sequence of two one-word utterances and one two morpheme utterance, would not be likely to have shown up at all in sentence oriented studies. In E3 my turn.do it and E4 this way.hold it.(3x)holding(2x) the "embedded" complements "to do it" and "to hold it" are present as well as the "matrix" sentences into which they are "embedded". E5 tape corder.in there without the pause would be a reasonable Hawaiian English structure, since in Hawaiian English there is no copula in equative sentences.

I feel that rather than considering each horizontal construction as having a more complex deeper form, part of which is deleted, we should consider the more complex surface forms to be made up of simpler surface forms. This essentially is the same proposal that Chao Yuen Ren (1968) has made in his grammar of spoken Chinese. In discussing the status of minor sentences in Chinese he says the following (p. 83):

> From the point of view of the pragmatics of speech, therefore, minor sentences are more primary than full sentences and it does help the understanding of sentence structure to analyze a full sentence as made up of minor sentences, both genetically and ontogenetically in the life of a speaker.

Vertical construction is just this process of developing larger constructions out of earlier separated units.

VIII.6.1 Interpretation of Vertical Construction

There are two possible interpretations of vertical constructions. The first is that for any utterance there is an underlying form in the child's competence that is restricted by some natural performance factors so that in production it must be separated into manageable units. This interpretation would take as proof of longer underlying structures the manifestation in vertical construction of the several elements. The argument is by analogy with the example in phonology of microphone, which at one stage was imitated only with difficulty but later, with no additional rehearsal, is pronounced in a fuller form. The implication is that the longer form was always there but not producible by the child. This is the "natural syntax" approach. Such an approach might find it hard to explain why the fuller form is not always present in vertical construction.

A second interpretation would be the opposite--that there is no deeper form of the utterances that are constructed vertically. This interpretation would claim that the vertical construction is the structure of discourse and it is only after learning to structure on this broader level that the child abstracts from this the ability to make longer constructions within a single utterance.

I think the most plausible interpretation is to assume that both processes are at work to some extent. To accept only the first interpretation would be to forget the important number of times that the child does not complete the longer structure without the assistance of interaction with another speaker. To accept only the second ignores the fact that in some cases Brenda moves from one element to the next without outside help. The fact that both of these processes have been observed over a long period of time suggests that the process of the development of syntax is, in fact, an interaction between the internal structures of the child's competence and the external structures of discourse.

VIII.7 BRENDA IV (171-172)

When we look at the data of session (171-172), two months later, it becomes obvious that an investigation of constructions of the complexity that are evident in this tape would require much more data. It would warrant a full investigation of the magnitude of BRENDA I and BRENDA II. For this study we have to remain content with this set of notes in the nature of an epilogue to the study that has preceded.

VIII.7.1 Re-emergence of Imitation

One of the most notable phenomena of (171-172) is that of imitation. Since the end of BRENDA II there was relatively little imitation of any kind. To be sure, there was a high degree of sensitivity to phonetic detail, but nothing of the sort that was found earlier. Then in (171-172) imitation of longer strings emerges for the first time as an active process. Table 24 gives a good example of the extent to which Brenda is willing to imitate. When I try to change the pattern she says read it which seems to indicate an attempt to get me back on to the track of imitations.

VIII.7.2 A New Type of Repetition

The expected repetitions of longer and longer utterances are found in BRENDA IV, for example, I like ice cream. I like ice cream. What is more typical, however, is the repetition with a change of some element, for example, Charlotte eat it. Charlotte eat mines,[1] in which the object is changed. Of the many examples of this type of repetition, which might be better called elaboration, Table 25 gives the most complex example which occurred to show to what extent this has developed. Braine (1973, p. 421) has called sequences of this type "replacement sequences". As this example shows, the technique is to keep one element constant while varying the others, apparently a form of play in which the possibilities of systematic construction are explored.

One final example will be given here to demonstrate to what extent Brenda's system has expanded in the two months between (161-162) and (171-172). Brenda says, Mommy was carrying it. Mommy was carrying it. Mommy was carrying monster book. From this replacement sequence it is clear that Brenda has developed considerably beyond simple two-word utterances.

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[1] Note that use of mines here is in accord with Hawaiian English.

VIII.7.3 Construction

Earlier (VII.7.2, p. 168) it was suggested that the limits on construction length might continue lifting. In that case we would find horizontal constructions of three word limits with vertical constructions of four element limits. Of course, this would imply a very complex structure for these constructions. As it turns out, from the evidence of (171-172), Brenda does continue to expand the limits of horizontal constructions, but perhaps these limits are not so clearly established as the scope expands. She also continues to make vertical constructions, but at least in no case on this tape do they consist of more than three elements. There are discourses proper of longer strings but they are discourses based on interactions with other speakers. Even in some few cases there appear to be monologues that are somewhat longer than three elements, but they resemble discourses rather than single adult sentences. Obviously this is only suggestive and a further study of the development of discourse would have to address itself to these problems.

Here are three examples which indicate three types of vertical constructions.

(13) (171)12 I like ice cream
13 I like ice cream
14 strawberry ice cream

In this case it can be seen that the intent is I like strawberry ice cream.

(14) (172)22 ladybug (B looking at picture in book)
23 ladybug
(R) Yeah, that's right.
24 two dems dere

Here the agreement between the pronoun and the ladybugs appears to be a case of discourse structuring rather than sentence structuring.

(15) (171)5 Open it
(S) You can open it.
6 I don't want to

An adult transformational grammar of 6 would probably generate it as /I don't want to open it/ at some underlying level and then delete the complement open it optionally. In this case, at least, the optionality of the rule could be eliminated by requiring deletion in the presence of 5, that is, prior statement of the complement. Whether or not this is the proper description of what Brenda is doing, of course, cannot be determined on the basis of one example. It is interesting to notice, though, her sensitivity to the discourse in this and in other examples we have looked at. It suggests that an analysis of the interaction between sentence and discourse structure at this level of development might be fruitful.

VIII.8 Summary of BRENDA III and BRENDA IV

The discussion of BRENDA III and IV has shown the convergence of several developments that began somewhat independently in BRENDA I. It can be seen now that the development of syntax rather than being an independent phenomenon rests on the foundation of an important earlier integration of phonology, intonation, and discourse.

The utterances of BRENDA IV appear to be the result of a long preparatory development, as well as the beginning of what is simply a new and more complex stage of the same development. It should be clear that the discontinuity between the so-called one-word and two-word or three-word stages is the result of focus on only a single aspect of development--the restriction on the length of horizontal constructions. From the point of view of the vertical construction there is no discontinuity. It can further be seen that vertical construction is what prepares the system for development.

SECTION IV

Method

> When we try to pick out anything
> by itself we find it hitched to
> everything else in the universe.
>
> \- John Muir[1] -

In the preceding sections the data of this study have been spread out, ordered and reordered with the intent of focusing on specific points. In this section I bring these specific points together. In this single chapter, Chapter IX, I begin with a review of the conclusions that have been scattered throughout this presentation. This is followed by an examination of the literature in which I compare my data on vertical construction with that presented by other investigators. Finally, I discuss the interaction between the method I have used and the conclusions I have drawn.

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[1] Quoted in Arden (1973).

CHAPTER IX

Linguistic Method and Theory

IX.1 Summary of Conclusions: BRENDA I through IV

Throughout this study conclusions have been drawn from the discussion of separate areas of reference. Here I will recapitulate these conclusions so that we can look at the relationships that exist between them.

IX.1.1 BRENDA I

In the discussion of Jakobson's stages I felt that although in general his claims were confirmed, a model of the acquisition of phonology, even at the earliest level, must include a mechanism of approximation. Those cases where no phonemic contrast can be established, and yet the segments tend to approximate later contrasts, must be explained.

The falling intonation contour was seen to develop during this period and to reach stability by the end. On the other hand, primary stress, which accompanies this falling pattern, was seen not to have been placed correctly.

The study of imitations showed that they function primarily to expand phonology. Repetitions serve to introduce redundancy. This redundancy compensates for an inadequate phonological system.

One of the more interesting findings was that by the end of BRENDA I, Brenda could talk with interested adults. This indicates at least a rudimentary control of discourse structure and a certain fluency in production.

There were very few cases of what appeared to be construction. This construction was of the topic-comment type. The comment element consisted of a word <awθu> which later disappeared. The continuity between this construction and later construction is difficult to establish.

IX.1.2 BRENDA II

The falling intonation contour that was well stabilized in BRENDA I underwent change in BRENDA II, apparently as a result of a change in phonology, namely the introduction of word final consonants. The effect was a temporary increase in level intonation. Stress, however, was correctly placed on the penultimate syllable by the beginning of BRENDA II. By the end of BRENDA II the falling contour had been re-established for the new phonological system and synchronized with correct stress placement. The result of these several developments was that utterances could be distinguished by primary stress and terminal contour.

Two types of imitation became apparent by the end of BRENDA II. One of these was elicited imitations. In these the mother and other speakers, including Charlotte, supplied Brenda with a word and then had her repeat it. The second type was the spontaneous imitation of adult forms whether or not they had been stressed by the adult. It showed up in improved surface phonetic shape when there was an immediately preceding adult model for the word. The primary function of imitation, which was to expand the phonological system in BRENDA I, was matched in this period by a new function which was to test words for salience in construction.

There was evidence for two not totally distinct types of repetition in BRENDA II, phonological repetition and discourse repetition. It was clear that Brenda had adopted a strategy of saying a word until either it was in her best possible surface form, until another speaker responded, or fatigue set in. These two types of repetition functioned to increase the intelligibility of the utterance. As the phonological system developed to the point of including final consonants and the accurate placement of stress and terminal contour, the utterances and the resulting discourse became progressively more intelligible. As a result there was a concomitant decrease in the two types of repetitions.

In the study of discourse interactions it was seen that by the end of BRENDA II Brenda had acquired an ability to control discourse interactions through the mechanism of the closed loop. By starting and ending a fragment of discourse she was able to guarantee feedback for her initial utterance as well as verification of her understanding of the response.

In one remarkable case, that of the word *microphone*, Brenda demonstrated the ability to remember forms well beyond her current productive maximum. She apparently was able to store the adult surface form until a time when her productive system had matured sufficiently to be able to say it in a longer form.

The study of constructions examined the most important single type of development. It was seen that there were two main types of construction, horizontal and vertical, and that vertical constructions also could be subdivided into four types. There were few cases of horizontal construction in BRENDA II, but vertical construction was seen to be an active process during that period. An upper limit on complexity was noticed for vertical constructions. It was found that constructions of the A type, i.e., two single words in sequence without repetition or interlocution, underwent phonological simplification. This is evidence that there is an interaction in vertical construction between phonological complexity and constructional complexity.

It was found generally that word order in vertical constructions followed that of the adult system but with some variation. In addition, there were a number of constructions that could be analysed as topic-comment constructions. Since there are constructions of this type in mature Hawaiian English, it may be that most of Brenda's constructions follow adult models.

Finally it was seen in the study of vertical constructions in which the speech of others intervenes that the source of vertical construction is discourse interactions.

IX.1.3 BRENDA III and BRENDA IV

In the study of later constructions we saw the emergence of true horizontal constructions. These were signalled by the elimination of the time lapse between the two words, by the primary stress and terminal intonation contour being applied to the two words as a single utterance, and by transition phonological features between the two words in some cases. Vertical constructions continued to operate in the same ways, except that as constituents they would accept horizontal constructions in addition to single words. There was evidence, then, that a limit of one word per utterance had been lifted to two words per utterance, and that this limit, since it applied to all utterances, allowed vertical constructions to include horizontal constructions as elements. It was also observed that at this time the number of elements in vertical constructions was expanded to a maximum sequence of three elements.

In BRENDA III we also noticed imitation and repetition of larger constructional units, whereas they had been largely restricted to phonology in the earlier stage.

IX.1.4 General Summary

The conclusions that have been enumerated above show that Brenda's system has the following general characteristics. Brenda can and often does make fully spontaneous utterances. These utterances have a definite surface target form. This form improves with an adult surface model immediately preceding. The form degenerates somewhat with distance from the adult model. Consecutive repetitions vary toward the target form. Repetitions occur until the best form is achieved, a form is accepted, or fatigue sets in. Imperfect forms (in terms of the adult model) are often accepted by understanding adults. Forms improve with time even in the absence of practice, i.e. there is maturation of a form even though that form itself is not practiced as a result of the general development of the system. There is a complementary relationship between repetitions and phonology at the earlier stage and repetitions and syntax at the later stage. That is, as intelligibility increases, repetitions in the corpus decrease. In all of the statements above, form can be taken to mean phonetic shape in the one-word period and constructional shape in the two-word period. This is evidence that it is the same mechanism operating and that it is the content which changes with development.

IX.2 Evidence in the Literature for Vertical Construction

I have observed in the speech of this one child a phenomenon that I have called vertical construction. I have argued that this is a very important ability of the child and that it is a prerequisite for horizontal (sentence) construction. The question that I have to answer, then, is: Why is this development coming to light at such a late date? If it is of the importance I am claiming it is and of the generality I think it is, where is the evidence in other studies? To begin to answer these questions I can quote Bloom (1972, p. 32) who has said,

> We went back to look at the literature on single-word utterances and discovered that no one has really studied single-word utterances in young children. All the accounts are anecdotal, or they are vocabulary studies. We realized that the beginning of grammatical competence, the origin of the child's knowledge of grammar, exists in the way he uses single-word utterances. To study the origins of grammatical competence, it is necessary to have some really well-documented, well thought-out studies of how children use single-word utterances.

In short, the main reason other investigators do not mention vertical construction is that they have not studied the period in which it first develops--the one-word period. Bloom's exasperation at this state of affairs is indicated when she says later in the same discussion (p. 46) "I sometimes get the impression that the whole world thinks children start out talking about pivot-open grammars. I don't believe it."

Looking back at some of the earlier literature, however, I found that it is not true to say that no investigators have reported vertical constructions. For example, Lewis (1937, 1971, p. 73) gives this dialogue for a child of 1;8.22 (Corresponds in age to BRENDA II)

Conversation between A and C.[1]

Where's Da gone?		
	gɔ	'gone'
Where?		
	dɑ	'Da'
Yes, but where?		
	ku:l	'School'

Gregoire (1948, 1971, p. 92) described what I have called vertical construction as follows:

> He uses at the end of the second year one-element sentences consisting of a single word or a few words which include only one major word. Here is a sample, from the 21st month, of three such communications which my younger son put together: coco; ti-ng, ti-ng; tutu. He says this in the morning in bed, to express the idea: 'I, Coco, hear the sparrows chirp; soon I'll have breakfast with confitures (jam)". During the first six months of the third year puzzles of this kind remain common.

Leopold (1953, 1971, p. 140) observed the fact that vertical construction precedes horizontal construction. He says,

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[1] Lewis does not elaborate these initials.

> There is often a transition from the one-word phase to the two-word phase in the form of two one-word sentences following each other.

He goes on to observe what must be vertical construction at the later period when each element may be a horizontal construction. This is Leopold's observation:

> Some early examples still betrayed, by striking pauses, the effort needed to combine the two patterns, subject-verb and verb-object, into one. (p. 140)

Observation of vertical construction is not exclusively reserved to the early studies of child language. As it turns out, it is reported in a number of recent studies. Gruber (1967, 1971) reports vertical construction in his paper on topicalization. His criteria are the same as those I have used: falling intonation and a pause between the elements. Gruber quotes Mackie as saying (p. 371) "he take the wheels. Fire engine." and then goes on to say,

> The falling intonation characteristic of declarative sentences is manifested independently in both "he take the wheels" and "fire engine", and there is a short but distinct pause between the two parts.

In spite of the fact that Bloom (1970 and 1972) has rejected vertical constructions as not being genuinely syntactic, she has mentioned them. Her criteria are the same as Gruber's and mine: falling intonation contour being applied to each word and an intervening juncture. Bloom makes much of the variability of the word order and concludes that these constructions could not be syntactic because of this. An example from Bloom (1970, p. 11) follows:

G:I (Gia picking up her mother's slipper)

	Mommy. Mommy.
What is that?	
	Slipper.
slipper.	
	Mommy.

The similarity of this example to Brenda's mama...shoe is striking. Further examples that Bloom gives from her child are these (1972, p. 24):

> 'door, open' as she passed a door being opened; 'door, open, Mommy' wanting Mommy to open the door; 'cut, Daddy' pointing to a band-aid on Daddy's finger; 'coat, Daddy' pointing to Daddy's coat in the closet.

It should be fairly clear from these examples that Bloom has observed the same phenomenon that I have. In her observations, however, there is no mention of whether these are all from the same period or whether any repetitions were present. That is, there is no means of knowing which of the varieties of vertical constructions are represented here. It can only be seen that they are vertical constructions of some type.

Brown (1973) makes some direct mention of vertical construction and gives several examples as part of another discussion. He says (p. 148),

> Bloom (1970), Leopold (1949), and others have noticed that shortly before the emergence of two-word utterances children often produce in succession two related single-word utterances.

From this quotation it is clear that Brown, like Bloom, considers this a phenomenon that only occurs briefly before the onset of sentences (horizontal construction). Yet he cites what are vertical constructions from later in Stage I when Adam says to Ursula Bellugi, "No, no Daddy chair, home soon." (p. 196) Or later (p. 206) Brown quotes Adam as saying "Ball. Hit ball." and "Kitty. Ride bulldozer. Get in kitty."

Discussion of vertical construction has appeared in several European sources that I am aware of. For example, Meggyes (1972, p. 160) says,

> In the language of my daughter at the age of 1 year 8 months and a half several one-word sentences, put beside each other forming unshaped utterances, alternated in a special way with shaped sentences of two members (or two elements).

I had completed a first draft of this study when the most dramatic confirming evidence became available to me. Mikeš, Dezso, and Vlahovic (Mikeš *et al*. 1972) in their work with children learning to speak Hungarian and Serbo-Croatian have come up with a general description of the development of construction that differs from mine mainly in the terminology they have invented. They have used six terms: (1) simple sentence, (2) word sentence, (3) word sentence block, (4) simple sentence block, (5) complex sentence, and (6) complex sentence block. For them "simple sentence" is defined as a two morpheme sentence. "Word sentence" is defined as a single morpheme sentence. "Word sentence block" is a sequence of two "word sentences". "Simple sentence block" is a sequence of two "simple sentences". "Complex sentence" is a sentence of more than two morphemes. A "complex sentence block" is virtually any combination of the above.

It is clear that the distinction that Mikeš, Dezso, and Vlahovic make between sentences and sentence blocks is the distinction I make between horizontal and vertical constructions. I think that their terminology, because of the general use of "sentence" for both one-word and two or more word horizontal constructions, tends to obscure the difference that I have been able to capture by reserving horizontal construction as a term for child speech which is equivalent to "sentence" for adult speech. I agree with other investigators who have tried to maintain the distinction between one-word utterances and those made up of more morphemes. For example, Brown (1973, p. 151) has argued against considering single-word utterances to be sentences and prefers to reserve that term for constructions of two or more morphemes under one sentence intonation contour.

Since I have had access to only one article in which this data is reported I do not know if Mikeš *et al*. have made the further set of distinctions within the sentence blocks of those with or without repetition or those with or without intervening discourse. They do make the same point I have made, however, about vertical constructions, which is, that they represent an earlier stage that leads into horizontal construction. They refer to sentence blocks as being "pre-transformational". By that they mean that what later appears to be done by transformation is first done in sentence block construction.

One final point that is made by Mikeš *et al*. is, again, a point that I have argued for, that is, that repetition in phonology parallels repetition in syntax. They argue that the earliest reduplications of syllables in phonology are the first instance of this phenomenon which later appears in the repetition of single words. Not only is repetition paralleled throughout the system, it is the major device of development. Repetition for Mikeš *et al.* is the starting point of language development.

IX.3 Selective Exclusion of Vertical Construction

One explanation that might be advanced for the relative lack of descriptions of vertical constructions is that they simply are not present in other children's speech. I think it is clear from the literature cited above that what I have called vertical construction is present, in general, in children's speech, and that in at least one case vertical construction has been treated as an important developmental phenomenon in the speech of children learning mature languages quite unrelated to English. The question, then, becomes: why have investigators who have actually reported vertical constructions not found them relevant? The answer was suggested more than thirty-five years ago when Lewis (1937, 1971, p. 65) complained that

> we need detailed observations of a child, showing not only what he said on successive occasions, but what was happening when he spoke. But since earlier observers, as I have said, have been more concerned with form than with function, published observations of this kind are lacking.

Malinowski's (1937, 1964, p. 64) review of Lewis's work confirms Lewis's emphasis on looking at the total situation as follows:

> Mr. Lewis's results show that the only correct treatment is to study the total situation: the vocal act of the child, which is linked up with the circumstances; and the reactions of the adults which respond to the child's prelinguistic activity.

Modern studies have continued the emphasis on form that Lewis laments by taking a single form--the sentence--as the focus of study. Dale (1972, p. 5) says "grammatical sentences and ungrammatical ones are the raw data of linguistics." Deese (1970, p. 1) goes even further to say, "a language is a set of sentences", and then again (p. 3) "the most basic idea in the whole of the study of language is that of the sentence." The centrality of sentences for McNeill (1970) is stated clearly in the following way (p. 2):

> Not only do children acquire knowledge of sentence structure--itself an important fact--but virtually everything that occurs in language acquisition depends on prior knowledge of the basic aspects of sentence structure.

In his introduction to A First Language Brown (1973, p. 3) makes it quite clear that it is "a work about sentence construction and sentence understanding." He qualifies his position somewhat by then saying,

> that is certainly not all there is to the acquisition of a first language; it completely excludes pronunciation and the growth of vocabulary.

Presumably by pronunciation and vocabulary Brown is speaking of phonology and lexicon. It is interesting that he implies, although he does not state explicitly, that it is possible to study sentences without reference to these other aspects. It is clear that for Brown sentences are virtually equated with linguistic ability. This becomes clearer later in his discussion of the cognitive prerequisites for semantics when he says (p. 155) that Bloom

> does not see that this evidence offers any compelling reason for supposing that single-word utterances are sentences nor even that the child's developing knowledge is as yet linguistic in character. I agree with her.

I agree with them that single-word utterances are not sentences, but I do not agree that because they are not sentences they are not linguistic.

Vetter and Howell (1971, p. 46) in their review of language acquisition studies have noticed the avoidance by investigators of the one-word period. This is what they say:

> Most of the recent studies of child language tend to bypass this universal stage and move directly to two-word or longer utterances. The implication of such an approach is that grammar actually begins with the sequencing of two words.

The problem is that the focus of studies has been too narrowly limited to the acquisition of grammar. Kaplan and Kaplan (1971, p. 359) have expressed the same point of view in this way:

> Concentrating on grammar, however, necessarily limits one to developmental sequences commencing somewhere between 12 and 18 months. This, in turn, has led many to regard the emergence of grammatical speech at this time as the advent of "true language".

They go on to question whether or not it is appropriate to call any child "prelinguistic". They conclude the following (p. 380):

> In our opinion there is evidence for significantly more continuity than has previously been supposed. In any event it has become increasingly clear that the first year is a significant period for language acquisition.

The Kaplan article ends by saying (p. 381) "it seems reasonable to conclude at this point that there is probably no such thing as a prelinguistic child."

Scherzer and Darnell (1972, p. 550) have also expressed their dissatisfaction with the narrow focus on sentences:

> Neither linguists nor anthropologists have as yet developed adequate units of description for speech use. The sentence, as ordinarily treated by linguists, is valid only for a narrowly referential function of language. It is abstracted from social meaning and relationships of use of concern to us here. And it is increasingly clear that limitation to the sentence misses generalizations, even of the narrowly syntactic sort. The text, or discourse, is more promising, but probably too gross. The various purposes accomplished in language--how people insult, show deference, command, request information, curse, greet, take leave, etc. do not come in sentences or whole texts. We are not sure what they do come in, but would suggest the speech act as the minimal structural unity in a description of speech use.

It can be seen from these citations as well as from the history of the past decade of linguistic research that an important decision is made at the point that the researcher decides what he will consider to be relevant data. In some cases, then, vertical constructions have been excluded on the basis that since they were not sentences they were not relevant.

There is another type of case in which it is simply impossible to know what has been recorded. Leopold (1953, 1971, p. 135) complains that

> the problem of how children learn to speak has always engaged the marginal attention of linguists. Too often their references to it have been casual and, on closer inspection, erroneous. The obvious requirement that reliable data must be collected before conclusions are drawn has too often been neglected.

Ruder (1972) found his attempts to replicate the pivot-open studies frustrated by the presence of data which he felt must have been present in other studies but disregarded. He says (p. 15)

> I suspect that the people who have generated these rules must have ignored at least part of the data. I have attempted to replicate this distinction in children's grammars based on mother-child interaction data and failed to come up with such a clear cut classification. Furthermore, not all the utterances by children were strictly nice two-word utterances with nothing else added to them. I believe that this junk or noise, or whatever you want to call it, that accompanies identifiable words in a child's utterance was just disregarded in previous studies. And I am not so sure that we can simply disregard this.

Of course, if we look at the studies Ruder refers to it is clear that much has been passed over. Braine, working with written records of the parents, could not have had any "junk" to worry about. As Braine (1963, 1971, p. 280) points out,

> The parents were instructed not to attempt to represent pronunciation, but merely to record in conventional spelling the word or sequence of words they heard the child say.

Braine defines the "first month" of his study as follows (p. 280):

> The month in which the first word combination (i.e. utterance containing two or more words) was uttered will be called the "first month".

Yet there is nowhere any definition of what criteria were used for deciding about these combinations.

IX.4 The Importance of Vertical Construction

It should be clear by now that studies of the acquisition of language by children fall into several camps. There is the linguistic camp which has taken the sentence as primary and held performance data in disdain. There is an ethnolinguistic camp which has urged the primacy of descriptions of performance data--especially as it relates to the functions of speech. There is also a camp of psychologists who have tenaciously held to the importance of developmental factors in language learning. These are never clearly segregated camps since we see, for example, that Brown does hold to the primacy of the sentence in linguistic description and in so doing sides with the linguists. On the other hand he asserts the importance of performance data. For example, Brown (1973, p. 56) says,

> Of course the data of performance have long ago been pronounced (Chomsky, 1964) an inadequate base for a grammar that attempts to represent competence or knowledge. I agree that it always is but I venture to say that not many people know how much can be milked from mere performance in the case of small children--especially conversational performance in which you can track relations between sentences.

I do not mean to develop the position of any one of these camps but rather to suggest that each has raised important questions for the others which I think have been resolved to some extent in this study of vertical construction.

To begin, I think it is clear that a narrow focus on the sentence has had the effect of excluding everything else from study. Throughout my study I have stressed the importance of such things as unintelligible utterances, discourse redundancies, and certainly the context of an utterance for making decisions about the internal structure of utterances. In other studies the narrow focus has also had the effect of excluding discourse. In these studies discourse has not been taken into account in the development of the child's ability to make constructions. In this I certainly support the ethnolinguistic position that the contextual setting of any utterance is of utmost importance--even for decisions about what might be called "syntactic" characteristics.

Malinowsky (1937, 1964, p. 63) voiced a plea to place "living speech in its actual context of situation as the main object of linguistic study." It is interesting that now, 37 years later, this is essentially the same plea that I am making. Of course, I am not alone in this. Bloom (1970) has clearly indicated the importance of context in making decisions about the structure of utterances. Jan Prucha (1972) has pointed up the importance of looking at a child's speech in its context as follows (p. 216):

> Dialogue represents the actual (and in fact prevailing) form of a child's linguistic behavior, and the study of language acquisition cannot be therefore divorced from all relevant conditions in which the speech acts occur.

This holistic approach to language acquisition can be found in early studies. In recent studies such as this one there is a return to the method of pre-generative work in child language but, of course, with the important difference of the knowledge and technical recording advances of the last ten or fifteen years. Hymes (1972) feels that this synthesis is an important development in linguistics. He says that (p. 101)

> if a decisive 'revolution' does occur in linguistics, it will be the integration of 'structural linguistics' (including transformational grammar) into a functional approach, that is, an approach which starts from the ethnolinguistic foundations of language as a human activity.

To introduce a question which has been raised frequently by psychologists I can quote Schiefelbusch (1972, p. 17) who talks about

> the weaknesses or limitations in current linguistics and psycholinguistics. Neither body of literature gives the functions that move the structure from point to point or from stage to stage.

Studies of child language acquisition have generally been content with describing a succession of "stages". Relatively little attempt has been made, at least by those with a linguistic orientation, to explain how one stage might be related to another. In exception to this, however, Lenneberg (1967, p. 283) has said,

> It is reasonable to assume that the formal processes that regulate the perception and production of sounds are essentially the same as those that enter into syntax and that the one-word stage is simply a transitional stage during which the rules are extended from the interaction of articulatory movements to the interaction of larger language units, namely morphemes and words, and that the eventual acquisition and mastery of grammar has its origin right at the beginning of language development.

Of course, at the time it was written, Lenneberg's statement was more an expression of faith than a suggestion about just how this might work.

Leopold (1953, 1971) speaks of a similar type of developmental continuity, which he calls "pre-patterning", between the babbling and the later one-word stage. He says (p. 137),

> Jakobson and others exclude babbling from their analyses. I find striking oppositions however, which might perhaps be characterized as a sort of experimental prepatterning. The postulated phonemic contrast between fully open vowels and fully closed stops was also prepatterned in babbling combinations like baba, dididi, and so was the early structural syllable pattern, consonant--vowel, both of which were carried over without break, or relearning into imitative speaking with meaning.

Lenneberg, then, has suggested that the processes that are active in the one-word period carry over into the two-word period. Leopold suggests that during babbling a type of prepatterning occurs which leads into the one-word period without break. Brown (1973, p. 200) in talking about sensorimotor development says,

> Not to say that the sensorimotor process is linguistic but rather that the linguistic process does not start from nothing and can build on data that are not linguistic.

I claim that the processes of vertical construction, including interaction in discourse and the use of imitation and repetition, are the same processes which are active from a very early period in a child's life. They are those very processes that Piaget (e.g. 1951) has described as the sensorimotor development of the child from birth to the first and second years. I feel that this claim has received important corroboration in the similar study of Mikeš, Dezso, and Vlahovic. Instead of regarding vertical construction as a somewhat puzzling but certainly nonlinguistic phenomenon from the one-word period, I consider vertical construction to be the central mechanism for the development of linguistic ability from the earliest use of language.

IX.5 Arguments against Vertical Construction

I have argued that vertical construction is an important mechanism of language development. A simple counter-argument would be to show that in some case vertical construction was not present in the normal development of some child's speech. Since this study is based on one child the field for this disconfirmation is left wide open. Unfortunately, because other studies have not included the same kinds of data, it is difficult to tell to what extent vertical construction has been central to the development of other children.

A trivial prediction based on my arguments for the centrality of vertical construction is that normal children would develop better than abnormal children. This is because vertical construction is based on discourse interaction and presupposes at least adequate hearing, vision, and cultural control of the communicative situation. There is one type of case of which I only know anecdotally but that I would find difficult to explain if it were true. In this case the child is reported to have not spoken at all until he was about four years old and then to have almost immediately begun to speak as a four year old. His development otherwise was normal and his family situation normal. If a case like this were well documented I think it would constitute a serious counter-argument to my claim of the importance of vertical construction. But, of course, even this would not rule out such hard to get at possibilities as silent rehearsal of interactions.

Since I have gone so far as to suggest that this process is a general process of language learning rather than specific to phonology or syntax, the acquisition of other language systems, for example signing for the deaf, would be interesting to study from this point of view. I would expect similar developments to occur in the acquisition of signs. However, if our knowledge of vertical construction is scanty for speaking children, it is nonexistent for signing children.

To build a general case for vertical construction would take studies of other children learning other languages, preferably studies made in both normal and abnormal settings. Since my conclusions are based on the speech of one child with confirmation from only one other source (Mikeš *et al*. 1972), any general statement that I make about vertical construction must be understood to be highly tentative.

IX.6 The Uses of Context in this Study

Diesing (1971, p. 277) has said in his study of method in the social sciences,

> Scientists react to the weaknesses of a method (and all methods have weaknesses) in two different ways. If they are not using the method themselves, they cite its weaknesses as sufficient justification for ignoring the method and its results, for despising it as unscientific or inadequate, and for not allowing their students to learn it. If they are using the method, its weaknesses become problems, challenges that make work interesting and results an achievement.

In this study I have chosen to take the inevitable dependence on performance data as a challenge. I feel that the results of having used the method I have used are sufficiently interesting and important to justify having used it. As Diesing says somewhat later in the same work (p. 286),

> One consideration that induces the holist to perservere in using his method despite its weaknesses and despite the slanders heaped on it is his feeling that it gets at something real that other methods miss.

I feel that vertical construction is something real and it is through the method of this study that it has come to light.

When I speak of "context" there are several things that might be understood. In this study I can isolate three more or less different types of context. Before treating them specifically, though, I want to point out that in referring to context one is also exercising his own intuitions of what constitutes context. That is, in this study for each type of context I used, there were some corresponding intuitions on my part about that context. I will try to make clear the intuitions of which I am aware after I describe the uses I have made of context.

I have said that there are three types of context for an utterance. They are (1) the surrounding utterances (linguistic context), (2) the nonlinguistic situation and (3) the communicative overlap between the child and the investigator. I have made much of the first type in this study. Bloom (1970) introduced the full use of the second type, and virtually all studies have relied on the third type.

The first type of context amounts to the speech of the child or other speakers which immediately precedes or follows any single utterance of a child. It is clear that my description of vertical constructions is entirely based on considering some of these sequences of utterances to be related. In addition to vertical construction my discussion of repetitions as well as decisions about imitations and spontaneous utterances depends entirely on knowing what utterances have preceded. Finally, I have been able to decide about the intelligibility of some utterances on the basis of the utterances which precede or follow it.

For instance, in the *mama...shoe* example, [šɪš] by itself might be wholly unintelligible but in the context of the string which leads up to the fairly intelligible [šuʔ], [šɪš] can be understood as *shoe*.

A second type of context is the nonlinguistic setting of an utterance. In the example just mentioned the fact that Brenda is holding up her mother's shoe aids one's understanding of the utterances considerably. This might be called a referential use of context. The nonlinguistic setting is also important in determining the semantic relations of constructions. This, in particular, is the use to which Bloom (1970) has put knowledge of context.

The third type of context to which I have referred is the communication overlap between the child and the investigator--in this case Brenda and me. What I mean by this is that I have brought to the study a group of assumptions about the language and culture of the child I am studying. I assume, for instance, that whatever she says, it is reasonable for me to take it as Standard English, Hawaiian English, or perhaps, Japanese. Or again, I assume that Brenda's knowledge of the world will not range outside of Hawaiian-American culture. I think it is clear that assumptions of this sort do form a context within which the entire study is carried out and that they are the general background present in any particular speech situation.

I have made crucial use of at least six major intuitions in this study. To begin, I assumed that sounds that were bounded by silence represented whole utterances. It should be remembered that at the beginning of this study the silence boundaries were fairly long but the intonation contour by which later utterances are marked had not developed. Later the utterances were also marked by the adult intonational pattern. On the basis of that marking, then, the more complex utterances of the later period could be determined. At the first, however, I had to simply assume that silence represented word boundary.

A second kind of intuition was employed in making decisions about repetitions and different words. For example, in (051) [ńene.nene.awau.] I took the first two utterances to be the same word but the third utterance to be a different word. I have no criterion for this decision other than my intuition about phonetic similarity of the first two and the difference from the third.

My decisions about imitation are related to the second intuition. Again I have no objective criteria for telling how close a suspected imitation must be to the imitated form to be called a true imitation. I simply had to refer to intuitions about similarity.

The fourth and fifth intuitions are closely related. I have said that I could do such things as gloss Brenda's utterances on the basis of context. This assumes that my understanding of context is similar to hers. In this I feel dependence on intuitions which would be highly unreliable if we did not largely share our culture. The second problem in making glosses is that the context is not always very clear.

In many cases the assignment of a gloss was made on the basis of a high degree of phonetic similarity either to the adult form or to Brenda's form at some other point where the context was clear.

Finally there is the use of intuitions in deriving word classes for grammatical analysis. I have mentioned the problems involved with this type of intuition earlier in this study (VIII.1.1, p. 173).

The reader may wonder what is the point of this confession. I am not the first investigator to use these intuitions and I have not proposed any way of avoiding their use. The point I want to make is that the use of the investigator's intuitions makes a difference depending upon where in the study the intuition is applied. A widespread use of some of the intuitions I have mentioned at the time of recording the data would highly prejudice the study. I found, for instance, that my ability to understand utterances could be enhanced with the addition of certain kinds of knowledge. If I had set as my purpose to study only intelligible utterances and made the selection of them at the time of recording (as must inevitably happen in diary studies), the amount of data would be greatly limited and the type of data would be limited to only those utterances which are most immediately intelligible.

In general, my method was to restrict as much as possible the exercise of my intuitions while in the process of recording. I continued this restriction as much as possible in making the transcriptions. At the time of making the analysis, however, I found the use of intuitions to be fruitful in understanding the child's language. And since at this stage decisions are not irrevocable, I could entertain hypotheses without altering the data base upon which the conclusions ultimately rested.

IX.7 Summary of Methodological Innovations

In this study I have used three types of data that have been excluded from other studies: one-word utterances, repetitions, and unintelligible utterances. These three types of data have been crucial to my argument for the importance of vertical construction. In the first place most of the data come from the "one-word" period--a period that has largely been ignored except by studies of phonology. In the second place I have used repetitions as an important indicator of development as well as an indicator of complexity in production. In the third place I have found that with experience of the child's world and developing phonological system I was able to "stretch" my understanding so that utterances which were at first hearing unintelligible became quite defensibly intelligible. It was on the basis of a number of these utterances that I first noticed vertical constructions. It is also true that because of the complexity introduced by vertical construction the phonetic shape of some of the words was affected. This had considerable importance in pointing up the constructional nature of the whole.

IX.8 A Final Note on Truth

One implication of my confession above of the extent to which I have relied on my intuitions is that another investigator with another set of intuitions would arrive at different conclusions. This is the hoary problem of the uniqueness of linguistic solutions. I do not intend to argue a position but rather to make clear my attitude. The two poles have been expressed by Derwing (1973) and Diesing (1971). Derwing, in referring to statements that linguistic solutions cannot be unique says (p. 35, 36),

> However much we may be inclined to attribute such remarks as these to the "humanistic impulses" of the investigator (Teeter, 1966, p. 475) it is clear that this permissive attitude is intolerable in serious scientific work.

Diesing addresses himself directly to the question of the scientific status of holistic theories as follows (p. 259):

> There is no valid reason to suppose that holist theories are a waystation on the road to some future set of general laws; I find no movement occurring in that direction. Nor, on a more descriptive level, is the classification of cases a procedure characteristic of infant sciences only, any more than the construction of mathematical models is a procedure limited to advanced sciences. Such views are simply fictions. Model-building and the classification of cases are alternative ways of bringing theory to bear on observation, and one need not lead to the other to be useful.

My own attitude is that what I have done is scientific but that its status as truth is entirely dependent on the extent to which other investigators will agree with the initial assumptions I have made. It is for this reason that I have tried to make these assumptions as clear as possible. My attitude is expressed in Chinua Achebe's novel about the contact of African and European cultures, *Things Fall Apart*. Many stories of unheard-of things reach the people in the villages. When they try to decide about the truth of one of these stories an elder finally says (p. 130),

There is no story that is not true...The world has no end,
and what is good among one people is an abomination with others.

SECTION V

Appendices

Appendix A contains the Tables that have been referred to throughout the text. Appendix B contains the bibliographic references.

APPENDIX A

The Tables

Table 1

Symbols Used

I. General symbols

[ ] - phonetic transcription, e.g. [pʰiŋgə] or [tʰəč].

/ / - phonemic form, e.g. /nana/ for [nene].

' ' - gloss or meaning, e.g. [nene] 'nurture'.

___ - a target word (English or Japanese). This notation is used particularly for the orthographic translations of Brenda's words in Brenda III and IV. In many cases it is difficult to maintain a distinction between gloss and target (' ' and ___) since the target form and gloss are identical. For example, [šuʔ](phonetic), shoe (target) and 'shoe' (meaning).

" " - quotation, introducing new terms, calling particular attention to a use which is unexpected, unusual, or questionable, e.g. "vertical construction" (a new term) or "pivot-open" (a questionable term).

< > - most general shape of a Brenda word (neither phonetic nor phonemic), e.g. <awəu>.

x x x- sounds which although audible to some extent could not be transcribed.

. - terminal utterance boundary. (See II.3.3 and IX.3 for discussion.) [ ], / /, and < > also indicate utterance boundaries.

. . . - deletion of some number (unspecified) of utterances.

~ - variation of the forms on either side, e.g. [s] ~[š].

(2x) - a number plus x in parentheses represents the number of repetitions, e.g. (2x) indicates two repetitions of the preceding utterance.

- utterance boundary is also indicated in the example format by listing separate utterances vertically. When written in the text a period (.) indicates final utterance boundary.

Table 1. (Continued) Symbols Used

II. Phonetic symbols

CONSONANTS:

		bilabial	labio-dental	dental	palato-alveolar	palatal	velar	glottal
STOP:	Voiceless	p		t			k	ʔ
	Voiced	b		d			g	
NASAL:		m		n			ŋ	
LIQUID:								
	Nasalized-Lateral			l^{n}				
	Lateral			l				
	Rolled			r				
FRICATIVE:	Voiceless		f	θ s	š		x	h
	Voiced		v	ð z	ž			
AFFRICATE:	Voiceless				č			
	Voiced				ǰ			
SEMI-VOWEL		w				y		

VOWELS:

		Front		Central		Back
High:	tense	i		ɨ		u
	lax		ɪ		ʊ	
Mid:	tense	e		ə		o
	lax		ɛ		ʌ	
Low:		æ		a		ɔ

Aspiration - raised h (occurs in $[p^h]$, $[t^h]$, and $[k^h]$)
Palatalization - raised y (occurs in $[b^y]$, $[t^y]$, $[d^y]$, and $[k^y]$)
Labialization - raised w (occurs in $[b^w]$, $[f^w]$, $[t^w]$)
Syllabic segment - ̩ (occurs in [l̩] and [r̩])
Full length - :
Half length - ˑ
Nasal vowel - ˜ (e.g. ĩ)
Voiceless vowel - ̥ (e.g. i̥)
Primary stress - ´ (e.g. báby)

Table 1. (Continued) Symbols Used

III. Examples of various notations

(1) [pʰiŋ̥gə]
[tʰəč] - phonetic transcription of a sequence of two utterances as they appear in examples.

(2) [pʰiŋ̥gə.tʰəč] - the same sequence as (1) as it appears in a line of text.

(3) finger
touch - target forms (translation) of the utterances of (1) and (2) as they appear in examples.

(4) finger.touch. - the same sequence as it appears in a line of text.

(5) 'I touch it with my finger.' - a gloss of the preceding vertical construction.

Table 2

Summary of the Tapes

BRENDA I

Tape	Date	Age	Time	Place	People Present
011	Feb. 12, 1972	1;0.2	11:00 a.m.	Brenda's home	Ch, M, R, S
012	Feb. 12, 1972	1;0.2	11:30 a.m.		B, Ch, M, R, S
021	Feb. 19, 1972	1;0.9	12:15 p.m.	"	B, Ch, M, R, S
022	Feb. 26, 1972	1;0.16	8:55 a.m.	"	B, Ch, M, F, R, S
031	Mar. 4, 1972	1;0.23	8:50 a.m.	"	B, Ch, M, F, R, S
032	Mar. 12, 1972	1;1.2	9:45 a.m.	"	B, Ch, M, R, S
041	Mar. 18, 1972	1;1.8	10:45 a.m.	"	B, M, R, S
042	Mar. 25, 1972	1;1.15	9:50 a.m.	"	B, Ch, Jill, M, R, S
051	Apr. 1, 1972	1;1.22	10:45 a.m.	"	B, Ch, M, R, S
052	Apr. 9, 1972	1;1.29	10:30 a.m.	"	B, Ch, M, R, S
ET1[a]	Apr. 9, 1972	1;1.29	11:00 a.m.	"	B, Ch, M, R, S
061	Apr. 15, 1972	1;2.5	10:45 a.m.	R's apt.	B, Ch, M, R, S
S11[b]	Apr. 29, 1972	1;2.19	?	R's apt.	B, Ch, M, R, S

---

[a] Experimental Tape 1 (ET1) was made to record a session immediately following (052) in which I tried to elicit specific words with photographs.

[b] Summer 1 Side 1 (S11) was made two weeks after the session called (061) as a follow-up but has not entered significantly into this study.

Table 2. (Continued) Summary of the Tapes

Tape	Date	Age	Time	Place	People Present
BRENDA II					
071,072	Sep. 12, 1972	1;7.2	1:40 p.m.	Brenda's home	B, Ch, M, R, S
081,082	Sep. 19, 1972	1;7.9	2:00 p.m.	"	B, Ch, M, R, S
091,092	Sep. 26, 1972	1;7.16	12:30 p.m.	"	B, Ch, M, R, S
101,102	Oct. 3, 1972	1;7.23	4:20 p.m.	"	B, Ch, M, R, S
111,112	Oct. 10, 1972	1;8	12:00 noon	"	B, Ch, M, R, S
121,122	Oct. 17, 1972	1;8.7	3:00 p.m.	"	B, Ch, M, R, S
131,132	Oct. 24, 1972	1;8.14	2:00 p.m.	"	B, Ch, M, R, S
141,142	Oct. 31, 1972	1;8.21	3:00 p.m.	"	B, Ch, M, R, S
BRENDA III					
151,152	Dec. 23, 1972	1;10.13	7:00 p.m.	"	B, Ch, F, M, R, S, and many others
161,162	Dec. 27, 1972	1;10.17	2:00 p.m.	"	B, Ch, M, R, S
BRENDA IV					
171,172	Feb. 22, 1973	2;0.12	3:00 p.m.	"	B, Ch, M, R, S

Table 3

Facsimile Page of Transcription

(from 141)

(B)	(Ch)	(Context)	(M)	(R)	(S)
121-123 tʰ [hɛđ] L (3x)		Ch pushes B down--B bumps head.	Ooh--Charlotte	Oop. Head? Let me see.	
124 [ɛ̃] CL	hehehe	B continues to sit by wall bumping her head.		Oh--yeah. Didn't crack open. It didn't crack open. Poor Brenda--poor Brenda bumped her head. It hurt?	
125 [bəmp] L					
126 [hɛ] L					
127 [bəmp] Fx			Charlotte, Mommy tired.	Yeah. What'd you bump? What'd you bump?	
128 [bəmʔɛ̃ʔ] C					Mommy tired. Go to sleep.
129 [bəmʔ:pʰ:mɨ]L					
130 [bamp] Fx			All right. Don't run away then.		
131 [bam] C					
132 [bam] L				What'd you bump?	
133 [bamʔ] Fx					
134 [tɛpʰ] F				Oh, don't. You're gonna hurt your head. (Laugh) She threatens to step on my microphone.	
135 [tɛpʰ] L					
136 [tɛpʰ] L					

B, Brenda; Ch, Charlotte; M, Mother; R, Ron; S, Suzanne

Table 4

Unintelligible Utterances

Tape	Unintelligible/Total Utterances	Percent Unintelligible
071	213/387	59
081	122/318	38.4
091	92/356	25.8
101	81/430	18.8
111	107/551	19.4
121	58/276	20.8
131	78/332	23.5
141	50/325	15.4

Table 5

The Words of (071)
Grouped by Category of Spontaneity

I. Spontaneous Words which are repeated in later tapes

GLOSS	SPONTANEOUS FORM	MODELED FORM
1. baby (3)[a]	bebi (pẽ)	bebi
2. bear (5)	bʸæu (bæu, biæu, bʸæ)	--
3. bed (2)	bɛtʰ	--
4. big (2)	bek	bik
5. blue (2)	pu	bu
6. Brenda (8)	pʰɛntʰə	—
7. cookie (3)	kukʰi	--
8. daddy (6)	dædi (æ~e)	--
9. eat (5)	it	--
10. hat (4)	hæʔ	--
11. (hor)sie (6)	šiʔ	--
12. mama (6)	mama	--
13. mommy (8)	mami ⁽ʔ⁾	--
14. nice	nəis	nəis
15. paper (5)	pʰeipʰ	--
16. pen (4)	p⁽ʰ⁾eyɛn	pʰæ̃ (æ~ai~ɛ) (æ̃n~æ̃ʔ)
17. see (3)	ušiʔ	ušiʔ
18. shoe (2)	šu	šuʔ
19. sick (2)	šɪk	--
20. swim (4)	šɛm	--
21. tape (6)	tʰeip⁽ʔ⁾či	tʰəɪš, tʰeitʰ
22. walk (5)	wakʰ	--
23. wowow	wəwəu	--

II. Spontaneous words which are not repeated in later tapes

1. boat	bout⁽ʰ⁾ (tʰ~ʔ)	--
2. bone	boni	--
3. Checkers	tʰe̜kʰo̜~kʰe̜kʰo̜	--
4. corder	gɔdəʔ	--
5. cut	kʰəʔ	--
6. hankie	heŋgiʔ	--
7. I do	aidu	--
8. mother	maðə	--
9. net	nɛ	nɛ⁽ʔ⁾~næ
10. pogo	pʰɔk̬ʰɔ($\overset{?}{h}$)	pʰɔkʰɔʔo
11. Ralph	rəuš	--
12. you too	yutʰu	--

---

[a] the number in parentheses indicates the number of repetitions.

Table 5 (Continued) Words of (071)

III. Modeled words which are repeated in later sessions as spontaneous

GLOSS	MODELED FORM
1. climb (2)	kʰæmə̄ (aim)
2. jump (3)	dəmə
3. orange (4)	awə
4. pencil (2)	pʰehšɪʔ
5. write (6)	rait

IV. Modeled words which are not repeated in later sessions

1. chameleon	liʔi
2. come	kʰə̄m
3. hand	hǣn
4. pussy	pʰuʔšiʔ

Table 6

Words of (141)

I. Spontaneous--used in more than one session

	GLOSS	SPONTANEOUS FORM	MODELED FORM
1.	black	bwækʰ	bwæk
2.	Brenda	brɛndə	brɛndə
3.	car	kʰa	--
4.	carry	kʰæwri	kʰæwi (kʰe:i)
5.	Charlotte	halɛt	--
6.	circle	šiko	--
7.	cook	kʰʊkʰ	kʰukʰ
8.	finger	pʰiŋgə	--
9.	fly	fwai	--
10.	flying	faiĩŋ	fawĩ (faiĩŋ)
11.	good	gut (guʔ)	--
12.	got	gaʔ	--
13.	hiding	haidi:	haidĩŋ (haidĩ)
14.	hurt	hərt	--
15.	lantern	yæntɪn (wæ̃tən)	--
16.	man	mæn	--
17.	milk	miwk	--
18.	mine	main	--
19.	mommy	mami	--
20.	my turn	maitʰun	--
21.	no	nəo	--
22.	Ron	ran	--
23.	share	šæʔ	--
24.	step	tɛp⁽ʰ⁾	tɛʔ (tɛpʰ)
25.	stuck	tʸʌk⁽ʰ⁾	--
26.	tape	tʰeip	--
27.	there	dɛə	dɛə
28.	toe	tʰou	--
29.	turn	tʰun	tʰən
30.	walk	wak	--
31.	walking	wakĩŋ (wakĩʔ)	--
32.	window	windo	windo

II. Spontaneous--not occurring in another session

	GLOSS	SPONTANEOUS FORM	MODELED FORM
1.	balloon	brũ:	bwũ / bwun
2.	boy	boi	bəi (boi)
3.	button	bətʰɪn	bətʰɪn
4.	ca(mera)	kæ	--
5.	give	(giɛuf,giɛv) giv	--
6.	head	hɛtʰ	hɛ

Table 6 (Continued) Words of (141)

	GLOSS	SPONTANEOUS FORM	MODELED FORM
7.	ital	ɪtʰai	--
8.	I went	əwɛu̯	--
9.	lost	(rɔš) rwɔs	--
10.	now	nau	--
11.	oops	əps	--
12.	owl(s)	aw(š)	awu
13.	page	peč	--
14.	Peter	pʰido	pʰido (pʰidɛ)
15.	pink	pʰĩʔ	--
16.	pink car	(pʰĩʔa) pʰĩʔkʰa	--
17.	pixie	pʰiks (pʰič)	--
18.	please	pʰiš	--
19.	pop	pʰapʰ	--
20.	read	ritʰ	--
21.	rolling	(roĩŋ) rowĩŋ	--
22.	say	se	--
23.	self	šɛuf	--
24.	something	səmtʰɛ	--
25.	touch	tʰəč	--
26.	triangle	taiŋgo/træŋgo	ǰræŋgo (čæŋgo)/ tɛŋgo, tæŋgo
27.	went	wɛnt, yɛʔn, rɛnt	--

III. Modeled but in more than one session

	GLOSS	MODELED FORM
1.	juice	duši
2.	Suzie (only modeled previously)	šušiʔ

IV. Modeled just this session

	GLOSS	MODELED FORM
1.	bump	bəmp/bəm(ʔ)
2.	can	kæn
3.	curtain	kutʰɪn
4.	find	faind (fain)
5.	going	guin
6.	microphone	məikrə̃ʔə̃/məikʸu
7.	mike	məiʔ
8.	nighttime	naitaim
9.	pumpkin	pʰəmpʰɛn/pʰəmpʰɛʔ
10.	witch	wɛč

Table 7

Words Used in More than One Session BRENDA II

baby	071, 081, 131
band-aid	081, 091, 101, 121
bear	071, 091, 101, 111, 121
bed	071, 111
big	071, 131
black	081, 111, 141
blue	071, 111
Brenda	071, 081, 091, 101, 111, 121, 131, 141
broke	091, 131
bucket	111, 131
bug	111, 131
bus	111, 121
car	111, 141
carry	081, 111, 141
cat	101, 131
chameleon	071, 101
Charlotte	081, 091, 101, 111, 141
circle	111, 141
climb	071, 131
cook	081, 101, 141
cookie	071, 121, 131
cow	081, 131
cup	111, 131
daddy	071, 081, 091, 101, 111, 121
dancing	111, 121
down	091, 111, 121, 131
drop	101, 131
duck	081, 091
eat	071, 101, 111, 121, 131
eating	101, 111, 121, 131
egg	101, 111
fall	091, 131
Fang	081, 101
fell	091, 111, 131
finger	121, 141
fish (ing)/(y)	081, 091, 111, 131
flower	091, 101
fly(ing)	101, 131, 141
foot	081, 091
get	091, 111, 121, 131
girl	091, 101, 111
good	111, 121, 141
got	111, 121, 141
hat	071, 081, 091, 111
hiding	101, 141
hole	091, 111
home	101, 121
horsie	071, 081, 091, 101, 111, 121
hot	081, 091, 101, 111, 121
house	101, 131
hurt	081, 141
ice	081, 111, 121
juice	101, 111, 121, 141
jump	071, 101, 131
Kimby	111, 121, 131
lantern	091, 141
mama	071, 081, 101, 111, 131, 141
man	081, 091, 101, 111, 121, 141
milk	101, 141
mine	101, 121, 141
mom	071, 091, 131
mommy	071, 081, 091, 101, 111, 121, 131, 141
monkey	091, 111, 131
monster	101, 121
more	111, 121, 131
my turn	091, 141
napkin	091, 121
nene	081, 101, 111
nice	071, 081, 091, 101, 111
no	081, 091, 101, 111, 121, 131 141
no more	101, 111
one	111, 131
open	101, 121
orange	071, 091, 111, 131
otemba	091, 131
own	111, 121
paper	081, 091, 101, 111, 121, 131
pen	071, 081, 091, 111
pencil	071, 081
plenty	081, 101, 111, 131
purple	081, 091, 101

Table 7 (Continued)

Words Used in More than One Session BRENDA II

rabbit	101, 121
red	101, 111, 121
Ron	111, 121, 141
see	071, 081, 091
share	101, 111, 141
shishi	081, 101
shoe	071, 101
shoyu	111, 131
sick	071, 081
sit(ting)	081, 091, 101, 111, 121
sleep(ing)	091, 111, 121
slipper	091, 131
soup	101, 131
spill	121, 131
step	101, 131, 141
stuck	101, 111, 121, 141
Suzie	081, 141
swim(ming)	071, 081, 091, 131
take	091, 131
talk	091, 111
tall	091, 121
tape	071, 081, 091, 111, 121, 141
thankyou	081, 121
there	081, 101, 141
tickle	081, 091
toe(s)	081, 121, 141
turn	081, 091, 141
two	081, 111, 121, 131
walk(ing)	071, 101, 111, 121, 141
want (too)	101, 121
water	081, 131
Wendy	081, 091
wet	101, 111
window	091, 141
wowow	071, 081
write	071, 081, 091, 111, 121, 131
yukky	111, 121

TOTAL: 118

Table 8

Words Used One Session Only BRENDA II

all pau	101	cup cakes	131	it	101
ate	121	curtain	141	itai	141
bag	091	cut	071	jack-o-lantern	091
ball	081	dangling	121	kick	091
balloon	141	dead	101	kitchen	101
bank	121	deer	131	kitty	101
bark	101	died	101	konbu	101
bash	091	do	111	late	081
bathroom	121	dog(gie)	101	leaf	131
Bert	121	Donald	121	lizard	101
birdie	101	doughnut	091	look	091
blanket	121	drink	111	lost	141
boat	071	"E"	091	lunch	111
bone	071	enough	111	m (and m)	121
book	101	Ernie	121	mada	111
boy	141	face	081	make	131
brown	081	fan	111	march	111
bubble	091	feed	111	me	131
bump	141	fight	131	men	141
burger	081	find	141	microphone	141
burn	101	finish	111	mike	141
burnt	121	five	131	mother	071
button	141	floor	121	much	131
buyad	121	fork	111	mush	131
ca(mera)	141	four	131	net	071
cabbage	101	Frankie	121	nighttime	141
can	141	fun	111	no fair	131
candy	121	give	141	noodle	121
catching	111	go	111	oh	101
cents	111	goat	091	one more	111
Checkers	071	going	141	oops	141
checks	091	gone	111	out	131
chew	121	green	111	ow	091
chicken	131	guava	101	owl	141
Cindy	101	gum	121	page	141
clock	101	hand	071	paste	091
close	121	hankie	071	pau	081
clown	091	head	141	pay	111
cold	111	heavy	091	pet	111
color	081	hop	131	Peter	141
come	071	hot water	131	pink	141
cool	111	hungry	131	pink car	141
'corder	071	I am	131	pixie	141
cream	111	ice cream	111	plate	121
cucumber	101	in	111	playing	121

Table 8 (Continued)

Words Used One Session Only BRENDA II

pogo	071	rug	121	teeth	121
pop	141	said	141	ten	131
pretty baby	071	sand	131	three	131
pull	101	sandbox	131	thumbkin	121
pumpkin	141	scissor	111	tick	101
push	111	scratches	121	ticket	111
pussy	071	self	141	tock	101
radish	101	seven	131	too	101
Raggedy	101	shell(s)	131	touch	141
rain(ing)	101	shopping	121	trees	131
raisin	111	sit down	081	triangle	141
Ralph	071	six	131	truck	121
rattle	121	slide	111	turtle	081
read	141	soft	091	waste	121
ready	131	some	131	watch	101
rice	081	something	141	went	141
ride	121	sour	121	white	101
right	111	spoon	111	wipe	121
rock	101	swing(ing)	091	witch	141
rolling	141	tamago	101	wood	131
Ronald	121	taste	131	word	111
Ronnie	081	teddy bear	111	yellow	081

TOTAL: 201

Table 9

Most Frequent Words BRENDA II

Frequency (Number of Sessions)	Words	Number of Words
8	Mommy, Brenda	2
7	no	1
6	daddy, horsie, mama, man, tape, write	6
5	bear, Charlotte, eat, nice, paper, walk	6
4	band-aid, down, fish, get, hat, hot, juice, orange, pen, plenty, sit, stuck, swim, two	14
3	baby, black, carry, cook, cookie, fell, flying, girl, good, got, ice, jump, Kimby, mine, mom, monkey, more, nene, purple, red, Ron, see, share, step, there, toe(s), turn	27
2	(See Table 7)	62
1	(See Table 8)	201
	TOTAL FOR BRENDA II	319

Table 10

Development of Some Stops in BRENDA II

Session: **Word**	071	081	091	101	111	121	131	141
tape	t^h	t^h	t^h	-	t^h	$\begin{vmatrix} t^h \\ t^y \\ t \end{vmatrix}$	-	t^h
tall	-	-	t^h	-	-	t	-	-
talk	-	-	$\begin{vmatrix} t^h \\ t^y \end{vmatrix}$	-	$\begin{vmatrix} t^h \\ t \end{vmatrix}$	-	-	-
tickle	-	t^h	$\begin{vmatrix} t^h \\ \check{c} \end{vmatrix}$	-	-	-	-	-
toe	-	t^h	-	-	-	t^h	-	t^h
turn	-	t^h	t^h	-	-	-	-	t^h
two	-	$\begin{vmatrix} t \\ t^y \end{vmatrix}$	-	-	$\begin{vmatrix} t^h \\ t^y \end{vmatrix}$	t^y	$\begin{vmatrix} t^y \\ \check{j} \end{vmatrix}$	-
step	-	-	-	$\begin{vmatrix} t^h \\ \check{c} \end{vmatrix}$	-	-	$t^{(h)}$	t
stuck	-	-	-	t^h	t	$\begin{vmatrix} t^h \\ \check{c} \\ t \end{vmatrix}$	-	t^y

Table 11

Summary of Intonation BRENDA I

Intonation Symbol	Session:	012	021	022	031	032	041	042	051	TOTAL
F		19	6	18	20	9	13	11	38	134
FX		11	1	16	37	78	27	71	102	343
L		22	4	29	23	55	74	14	33	254
R		6	5	1	4	4	13	6	5	44
C		8	12	10	30	7	17	7	5	95
(Misc.)[a]							(64)			(64)
Totals		66	28	74	114	153	207	109	183	934

[a] Some of these may have, in fact, been in the other categories. They were not transcribed since their status as separate utterances is somewhat questionable.

Table 11 (Continued)

Summary of Intonation BRENDA I

Session:	012	021	022	031	032	041	042	051	TOTAL
F percent of Total	40.9	25.8	45.9	48.2	52.3	19.3	75.2	76.1	55.1
L percent of Total	25.8	10.7	39.2	17.5	35.9	35.7	14.6	18.1	27.2
F + L percent of Total	66.7	36.5	85.1	65.7	88.2	55.0	88.2	94.5	78.3
FX percent of Total	16.7	3.5	21.6	32.5	47.7	13.0	66.1	55.7	36.7
FX percent of F	40.8	14.3	47.1	67.3	89.0	67.5	87.7	72.9	71.9

Table 12

Intonation for the Eight Words Session (051)

	FX	F	L	C	R	TOTAL
1. awəu	26	14	7	2	0	49
2. nau	22	2	3	1	1	29
3. dædi	14	6	2	0	0	22
4. dæyu	8	5	2	0	1	16
5. nene	8	4	2	0	0	14
6. e	1	0	9	0	0	10
7. mæmə	5	1	0	1	0	7
8. ada	6	0	0	0	0	6
Unclassified	13	4	9	1	3	30
				TOTAL		183

Table 13

Summary of Intonation BRENDA II

Intonation Symbol	Session:	071	081	091	101	111	121	131	141	TOTAL
F (total)		130	111	131	165	306	171	196	162	1372
FX		38	28	55	50	109	77	69	40	466
L		174	159	174	242	196	90	84	123	1242
R		26	14	9	8	10	11	19	16	113
C		38	25	40	12	35	9	41	24	214
Totals		368	309	354	427	547	281	330	325	2940
F percent of Total		35.3	35.9	37.0	38.6	55.9	60.9	59.4	49.8	46.7
L percent of Total		47.3	51.5	49.2	56.7	35.8	32.0	25.5	37.8	42.2
F + L percent of Total		82.6	87.4	86.2	95.3	91.8	92.9	84.9	87.6	88.9
FX percent of Total		10.3	9.1	15.5	11.7	19.9	27.4	20.9	12.3	15.5

Table 14

Imitation in BRENDA I

Example	Tape	Utterance	Time Lapse (Sec.)	Input Speech
E1 S[a]	(012)			Kukla, Fran, and Ollie!
			24 1/5	x x x
		2 lei:		
E2 E	(012)			Doll x x x. Dada. Dada.
			23 4/5	x x x
			17 4/5	
		21 da		
		22 da		
E3 E	(012)			Flower, hm?
			9 1/5	x x x
		30 flɔhə		
E4 E	(012)			Hakata doll.
			1 2/5	
		10 ka		
E5 E	(021)			Yellow. Yellow crayon.
			19 4/5	x x x
		1 iu:hu↑[b]		
E6 S	(021)			What color do you like? xxx
			23 1/5	
		3 gæu		
E7 S	(021)			I got my farm books.
			3	
		8 bau		
E8 E	(022)			Boat? Boat?
			10 2/5	
			6	
		55 bæ		
E9 S	(031)		14 4/5	Hello.
			7 2/5	Hello.
		65 o		

[a] S indicates a spontaneous imitation. E indicates an elicited imitation.

[b] ↑ indicates ingressive airstream.

Table 14 (Continued)

Imitation in BRENDA I

Example	Tape	Utterance	Time Lapse (Sec.)	Input Speech
E10 S	(032)			Can you read this book?
			9	
		21 bʊʔ		
E11 E	(032)			Dropped. Did it drop?
			4 3/5	
		152 dʌp		
E12 E	(041)		8 2/5	Bears. Hm. Two bears.
			9 4/5	
		24a bə		
		24b bæ		
E13 E	(041)			Telephone.
			4	
		191 tɛl		
E14 S	(042)			Where did it go? Where did it go?
			14 2/5	
		55 geu		
E15 S	(051)	121 ab		
		122 ada		
				She wants another one.
			2 3/5	
		123 ada		
				Atha?
		124 adðaʔ		
				Ada.

Table 15

Repetitions in BRENDA II

Tape/Utterance	Word		Time between repetitions
(012)3, 4	nene	(2x)	8 1/5
21, 22	da	(2x)	1 3/5
59, 60, 60a, 61	nene	(4x)	21 4/5, 1 3/5, 7 2/5
62, 63, 64	nene	(3x)	3 1/5, 1 3/5
(051)6, 7	nene	(2x)	2 1/5
15, 16	dædi	(2x)	1 2/5
20, 21, 22	nene	(3x)	2 4/5, 1 2/5
27, 28, 29	awəu	(3x)	1 3/5, 2 3/5
30, 31, 32	dæyu	(3x)	1, 8
33, 34	awəu	(2x)	2 2/5
36, 37	awəu	(2x)	2 2/5
38, 39, 40, 41, 42, 43	awəu	(6x)	2 1/5, 2 2/5, 4 3/5, 2 3/5, 3 3/5
46, 47, 48, 49, 50, 51, 52	dædi	(7x)	11 3/5, 4 3/5, 2 2/5, 1 4/5, 8, 10 1/5
66, 67	lala	(2x)	2
93, 94, 95, 96, 97, 98	nau	(6x)	2, 1 2/5, 1, 1 2/5, 1 4/5
134, 135, 136, 137, 138, 139, 140, 141	awəu	(8x)	5 4/5, 2 1/5, 1 4/5, 1 4/5, 1 4/5, 1 4/5, 2 1/5

Table 16

Imitation in BRENDA II

Example	Tape	Utterance	Time Lapse (Sec.)	Input Speech
E1	(071)			Mommy, you wanna play--pussy cat again?
			1 2/5	
		190 p^{h}ʊʔsɪʔ		
E2	(071)			You're gonna tape, right?
			1 2/5	
		43 t^{h}eɪt^h		
E3	(061)			Suzie!
			1 3/5	
		125 čušɪʔ		
E4	(091)			That's jack-o-lantern. Jack-o-lantern.
			6 2/5	
			4/5	What's that?
		21 ɪɛ̃t^{h}ɔ		
E5	(101)	44 eɪk^h		
		45 eɪk^h		
		46 eɪk^h		
				Tamago?
			4 4/5	
		47 mogu		
		48 magu		
		49 eɪk^h		
E6	(101)			I can draw a better egg. Drew on your letters. Monster!
		50 m		
		51 eɪk^h		
		52 eɪk^h		
		53 eɪk^h		
		54 eɪk^h		
		55 eɪk^h		
		56 eɪk^h		
		57 mawnt^{h}u (3x)	10 3/5	
E7	(121)	70 bas		(laughing) You saw lady wearing blanket on the bus. [bəʔəsʔə̃ʔə̃ʔ]
		71 baš		
			1 2/5	
		72 bəʔəš		

Table 16 (Continued)

Imitation in BRENDA II

Example	Tape	Utterance		Time Lapse (Sec.)	Input Speech
E8	(131)				Next time I want some shoyu on it.
				2 1/5	
		30	šiyo		
E9	(131)				Boy, you put so much shoyu.
				2 2/5	
		71	mač		
E10	(131)				One.
				3/5	
		276	wən		
					Two.
				1 1/5	
		277	t^{y}u		
					Three. (3 sec.) Three.
				4 3/5	
		278	čič		
					Four.
				2 3/5	
		279	fwa		
					Five
				4/5	
		280	fai		
					Six.
				1	
		281	šɛʔk^{h}ɪ		
					Seven.
				1	
		282	šedɛn		
				1 1/5	
		283	sewɛn		
E11	(141)	2	haidɪ:		
					Hide? What's hiding?
		3	brũ		
					Oh, the balloon? Where? Where is it? Where is it?
				20 4/5	
		4	haidɪ̃ŋ		

Table 16 (Continued)

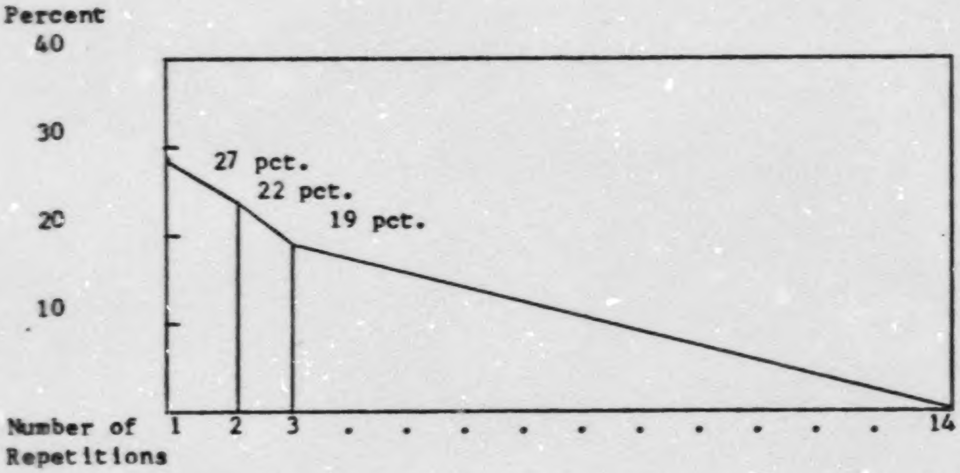
Imitation in BRENDA II

Example	Tape	Utterance	Time Lapse (Sec.)	Input Speech
E12	(141)			Where? Can't you find it?
			2 1/5	
		15 faind		
		16 fain		
E13	(141)			It's almost nighttime?
				It's almost nighttime?
			3 2/5	
		120 naitaim		
E14	(141)			Poor Brenda bumped her head.
				It hurt? Bump it again.
			5 3/5	
		125 bəmp		
		126 hɛ		
E15	(141)			No, you can't step on my microphone!
			2 1/5	
		173 məikrə̃ʔə̃		
				Microphone! Come on, say it right.
			3 4/5	
		174 məik^{y}u		
		175 məik^{h}o		

Table 17

Frequency of Repetitions

(071)



(141)

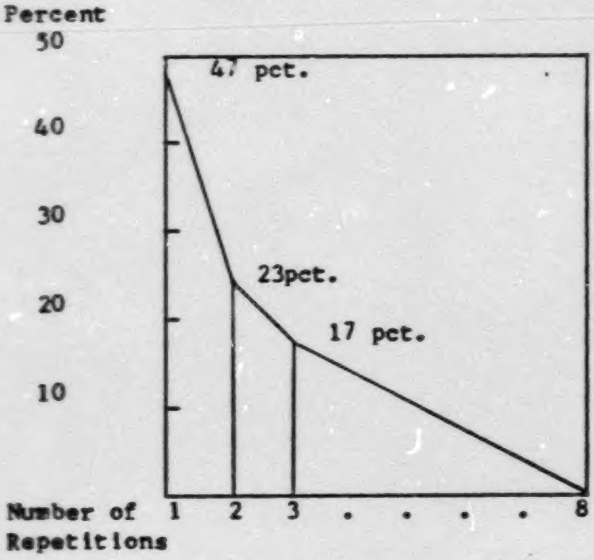


Table 18

Adult Speech

I. Adult Mean Length of Utterance

	(041) age 1;1.8 MLU 1.0		(171) age 2;0.12 MLU 2.29	
	To Brenda	To Others	To Brenda	To Others
Mother	1.78	5.52	3.13	5.08
Investigator	3.57	6.48	3.29	5.48

II. Questions and Declaratives/Imperatives (percent of total speech)

	(041)				(171)			
	To Brenda		To Others		To Brenda		To Others	
	Ques.	Declar.	Ques.	Declar.	Ques.	Declar.	Ques.	Declar.
Mother	39.8	60.2	15.5	84.5	34.0	66.0	20.8	79.2
Investigator	46.0	54.0	16.7	83.3	42.7	57.3	35.0	65.0

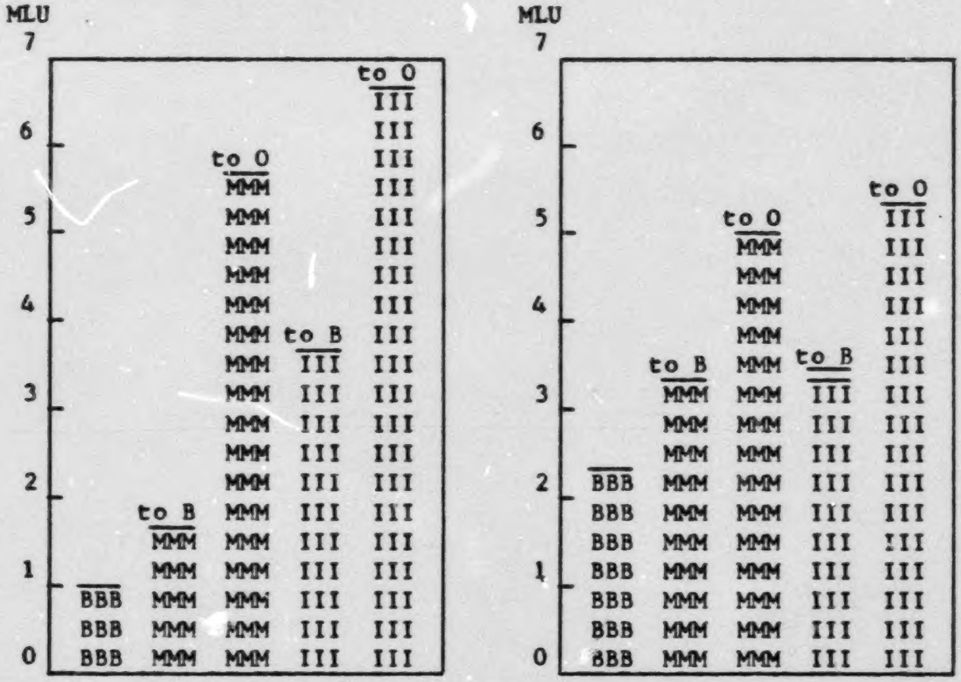
III. Percent of Total Speech

	(041)		(171)	
	To Brenda	To Others	To Brenda	To Others
Mother	87.9	12.1	66.2	33.8
Investigator	67.4	32.6	85.3	14.7

Table 19

Adult Speech--Graphs

I. Mean Length of Utterance (MLU)



(041) (171)

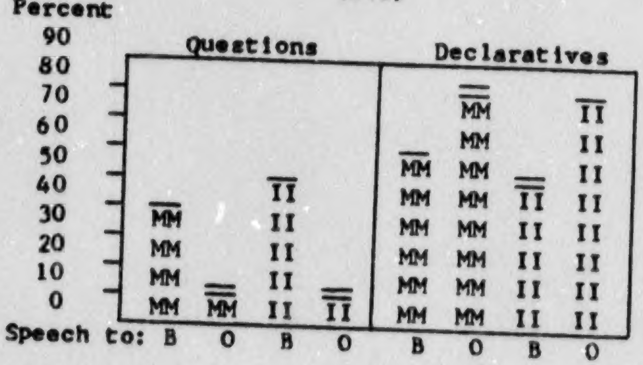
BBB - MLU for Brenda
MMM - MLU for Mother
III - MLU for Investigator
to B - speech directed to Brenda
to O - speech directed to others (may include Charlotte)

Table 19 (Continued)

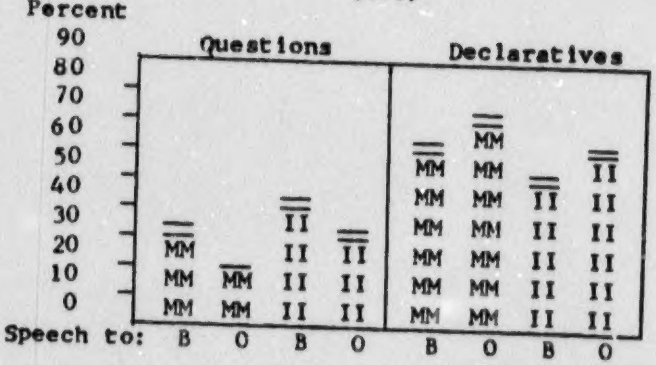
Adult Speech--Graphs

II. Questions and Declaratives/Imperatives (percent of total speech)

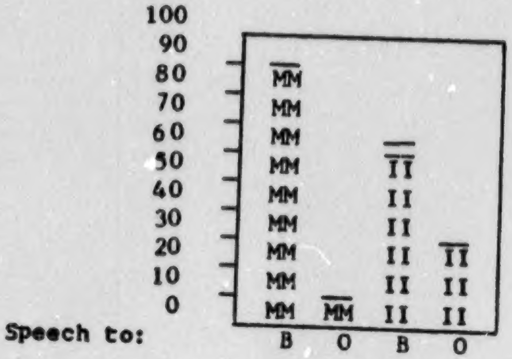
(041)

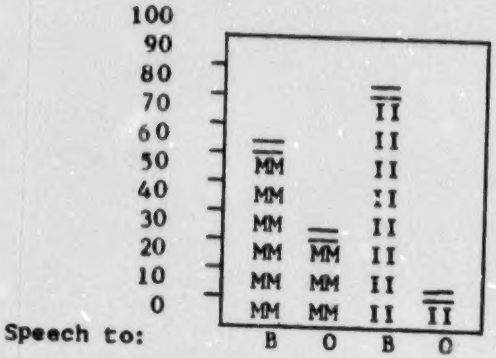


(171)



III. Percent of Total Speech





MM: Mother's speech
II: Investigator's speech

Table 20

Constructions from BRENDA II

	Tape	Utterance	(Repetitions)	Input Speech
E1	(071)63-65	net	(3x)	
	66	you do	(2x)	
	67-71	net	(5x)	
	72	you do	(2x)	
E2	(071)250-253	Mommy	(4x)	(pulling things out of M's closet)
	254, 255	hankie	(2x)	
E3	(071)259-262	Mama	(4x)	
	263-269	[š]...shoes	(7x)	
				(S) Shoes!
	270-272	[š]...shoe	(3x)	
E4	(071)277	Mama		
	278-282	shoe	(5x)	
E5	(071)307-309	boat	(3x)	
	310-312	s...swim	(3x)	
				(M) Swim, yeah.
	313-315	boat	(3x)	
				Boat swims, yeah.
	316-318	boat	(3x)	
	319	[swɛˀəbəutʸ]	(1x)	
	320	boat		
E6	(091)77-79	tall	(3x)	
	80	Brenda		
	81-	tall		
	86	clown		(Note that although there are 4 utterances between 81 and 86 it is impossible to determine which are tall and which are clown--see III.9, p. 77)
	87-90	tall	(4x)	
	91	girl		
	92-96	clown	(5x)	
	97, 98	tall	(2x)	
E7	(121)49	Brenda		
	50	sleeping		

Table 20 (Continued)

Constructions from BRENDA II

	Tape	Utterance		(Repetitions)	Input Speech
E8	(121)	67	Kimby		
					(M) What about Kimby?
		68	close		
E9	(121)	120	Brenda		
					(M) Oh, Brenda?
		121-123	ate	(3x)	
		124	eating		
E10	(131)	16-21	hot water	(6x)	
		22	hot		
E11	(141)	2	hiding		
					(R) Hide? What's hiding?
		3	balloon		
E12	(141)	18-20	Ron	(3x)	
					(R) What?
		21-25	carry	(5x)	
E13	(141)	27	tape		
		28	step		
E14	(141)	43-45	dere	(3x)	
		46-49	black	(4x)	
E15	(141)	129	bump me [bəm:p^{n}:mi]		
E16	(141)	139	finger		
		140	touch		
E17	(141)	158	read		
		159	page		
E18	(141)	201	cook		
		202	say		(R) Hm? (S) The cook said. (R) What'd the cook say?
		203	something		
E19	(141)	231	please		
		232	read		
E20	(141)	253	owl		
		254, 255	flying	(2x)	

Table 20 (Continued)

Constructions from BRENDA II

Tape	Utterance	(Repetitions)	Input Speech
E21 (141)	291,292 car	(2x)	
	293,294 pink car	(2x)	
	295 pink		

Table 21

Horizontal Constructions BRENDA III

Group 1

Ron talk
Brenda talk
corder talk
cat sleeping
monster go
monster eat
Brenda read now
more coming out
Peach Boy coming out

Group 2

see that
eat this
read dat
like that
like that song
see Ron
drink soup
wash clothing
wash clothes
hiding Halet[a]
hiding Brenda
lock it
read it
now read it
do it
use it
pick it
wind it
hold it
find it
found it
have it
stick it
scrub it
clean it
dry it
drain it
write it
bring it

Group 3

picture mark
key lock

Group 4

bring home
bring it home
take home
taked it home
fill up
fill it up
fill up it
cut it down
tree down
horn off
leave it on
put it on
get out
get up
turning around
gassing up

Group 5

who dere
Brenda here
water on it

Group 6

in there
on dere

Group 7

icy juicy
my turn
scary monster
banana leaf
tape corder
tape cording
horsie-ride
paper napkin

Group 8

dat one cat
dis cat
this way
this is way

Group 9

dog some
doggie some

Group 10

thank you
don't Halet[a]

---

[a] Halet is Charlotte

Table 22

Distribution of Utterances in BRENDA III

		Number	Percentage
(161)	One-word	186	53.4
	Two-word	77	22.1
	Unintelligible but can be transcribed	77	22.1
	Not transcribable	8	2.4
	TOTAL	348	
(162)	(Selected 185 out of 500 "feet")		
	One-word	80	45.7
	Two-word	83	47.4
	Unintelligible but can be transcribed	7	4.0
	Not transcribable	5	2.9
	TOTAL	175	

Table 23

Vertical Constructions BRENDA III

E1 Brenda
see that

E2 Ron
make
tape corder

E3 my turn
do it

E4 this way
hold it (3x)
holding (2x)

E5 tape corder
in there

E6 tape corder
use it (2x)
(R) Use it for what?

E7 talk
corder talk
Brenda talk

E8 banana leaf (2x)
pick it (6x)

E9 bathtub
scrub it (2x)
paper napkin

E10 rabbit
put it on

E11 writing (2x)
read dat

E12 cut it down (2x)
strong
read dat (2x)

E13 scary monster
read dat

E14 rotten
food
dog some

E15 door (2x)
knock-knock
key lock (2x)
lock

E16 there
Daddy

E17 cookie
ee
monster go

E18 monster (4x)
swim
water

E19 scared (2x)
monster eat
scared (4x)

E20 horn off (4x)
bring it home (2x)
bring home
bring it home

E21 horn off
bring it home (8x)

E22 picture mark
this
this
this way

Table 23 (Continued)

Vertical Constructions BRENDA III

E23 picture mark
this way (2x)

E24 Brenda
this way
picture mark
dis is way
this way (2x)

E25 shut
lock it (6x)

E26 who dere?
Brenda here
Brenda

E27 dere
found it
have it (6x)

E28 Ron
(R) O.K.
Ron talk

E29 turning (3x)
turning around

E30 see
see Ron

E31 sleeping (3x)
cat sleeping

E32 dat one cat (2x)
dis cat
dis

E33 more
more coming out

E34 bend it
bend
bend it

E35 soup (4x)
(R) What are you talking about?
drink soup

E36 wash clothing
wash (3x)
wash clothes (2x)

E37 tree down
tree

E38 take home
taked it home
home

E39 like that
like that song

E40 [æˀ] hiding Halet
hiding Halet
(R) Who's hiding Charlotte?
What's this?
hiding Brenda (2x)
(R) Where?
Brenda
hiding (2x)

Table 24

Imitations from BRENDA IV

	Brenda	Ron
(172)57	fishes	
		Lobster.
58	lobster	
		Shrimp.
59	shrimp	
		Fiddler Crab.
60	fiddler crabs	
		This hermit crab.
61	dis hermit crab	
		This is a spider crab
62	this i pider crab	
63	this is one[a] crab	
		This is a lobster.
64	this i lobster	
		This is a blue crab.
65	dis i a blue crab	
		This is a--shrimp.
66	this is um--spider one	
		Spider one. No, this is the spider crab. Yeah.
67	no	
68	pider crab	
69	dis i yellow fi--	Where's the yellow crab?
70	dis i yellow crab	
		Is that what you said?
71	read it	
		O.K.
72	read it	
		O.K. Let's look some more.
73	dere	

---

[a] Hawaiian English may have one in places where Standard English invariably has a.

Table 25

Elaboration in BRENDA IV

(172)157 dis goldfish
158 they goldfish
159 this one[a] goldfish
160 I found one goldfish
161 I found one goldfish
162 I--I found one goldfish
163 I found one goldfish
164 I found one fish
165 that one fish

---

[a] See footnote Table 24, p. 286 on the indefinite article in Hawaiian English.

APPENDIX B

Bibliographic References

This appendix has two sections. The first section lists the references cited in alphabetical order. The second section is an index of these references in the text.

ACHEBE, Chinua. 1959. Things fall apart. Greenwich, Conn: Fawcett Publications, Inc.

ARDEN, Harvey. 1973. John Muir's wild America. In: National geographic, Vol. 143, No. 4, 433-461.

BAR-ADON, A. and W. F. Leopold (Eds). 1971. Child language: a book of readings. Englewood Cliffs, New Jersey: Prentice-Hall.

BEVER, Thomas G., Jerry A. Fodor, and William Weksel. 1965. Theoretical notes on the acquisition of syntax: a critique of "contextual generalization". In: Bar-Adon, A. and W. F. Leopold (Eds). 1971. Child language: a book of readings, 253-278. Englewood Cliffs, New Jersey: Prentice-Hall.

BICKERTON, Derek. 1973. The chimera of context. Working papers in linguistics. Vol. 5, No. 6, 1-21. Department of Linguistics, University of Hawaii.

BLOOM, Lois. 1970. Language development: form and function in emerging grammars. Cambridge, Mass.: MIT Press.

__________. 1972. Semantic features in language development. In: Schiefelbusch, Richard L. (Ed). Language of the mentally retarded, 19-33. Baltimore: University Park Press.

BOWERMAN, Melissa. 1973. Early syntactic development: a cross-linguistic study with special reference to Finnish. Cambridge, England: Cambridge University Press.

BRAINE, Martin D. S. 1963. The ontogeny of English phrase structure: the first phase. In: Bar-Adon, A. and W. F. Leopold (Eds). 1971. Child language; a book of readings, 279-289. Englewood Cliffs, New Jersey: Prentice-Hall.

__________. 1973. Three suggestions regarding grammatical analyses of children's language. In: Ferguson, Charles A. and Dan Isaac Slobin (Eds). 1973. Studies of child language development, 421-429. New York: Holt, Rinehart and Winston, Inc.

BROWN, Roger and Ursula Bellugi-Klima. 1964. Three processes in the child's acquisition of syntax. In: Bar-Adon, A. and W. F. Leopold (Eds). 1971. Child language: a book of readings, 307-318. Englewood Cliffs, New Jersey: Prentice-Hall.

__________, Courtney Cazden, and Ursula Bellugi-Klima. 1968. The child's grammar from I to III. In: Bar-Adon, A. and W. F. Leopold (Eds). 1971. Child language: a book of readings, 382-412. Englewood Cliffs, New Jersey: Prentice-Hall.

BROWN, Roger. 1973. A first language: the early stages. Cambridge, Mass.: Harvard University Press.

BUSH, C. N. M. L. Edwards, J. M. Luckau, C. M. Stoel, M. A. Macken, and J. D. Petersen. 1973. On specifying a system for transcribing consonants in child language: a working paper with examples from American English and Mexican Spanish. Child Language Project, Committee on Linguistics, Stanford University.

CHAFE, Wallace L. 1970. Meaning and the structure of language. Chicago: The University of Chicago Press.

CHAO, Yuen Ren. 1968. A grammar of spoken Chinese. Berkeley: University of California Press.

CHOMSKY, Noam. 1964. Formal discussion of Miller and Ervin's the development of grammar in child language. In: Bar-Adon, A and W. F. Leopold (Eds). 1971. Child language: a book of readings, 340-343. Englewood Cliffs, New Jersey: Prentice-Hall.

DALE, Philip S. 1972. Language development, structure and function. Hinsdale, Illinois: Dryden Press.

DEESE, James. 1970. Psycholinguistics. Boston: Allyn and Bacon, Inc.

DERWING, Bruce L. 1973. Transformational grammar as a theory of language acquisition. Cambridge: Cambridge University Press.

DIESING, Paul. 1971. Patterns of discovery in the social sciences. Chicago: Aldine-Atherton.

DRACHMAN, Gaberell. 1973. Studies in the acquisition of Greek as a native language: I some preliminary findings on phonology. In: Working papers in linguistics. No. 15, 99-114. Ohio State University.

EDWARDS, Mary L. 1973. The acquisition of liquids. In: Working papers in linguistics. No. 15, 1-54. Ohio State University.

FILLMORE, Charles J. 1968. The case for case. In: Bach, Emmon and Robert T. Harms (Eds). Universals in linguistic theory, 1-88. New York: Holt, Rinehart, and Winston, Inc.

FRIES, Charles C. 1952. The structure of English. New York: Harcourt, Brace and Company.

GREGOIRE, Antoine. 1948. L'apprentissage du langage. In: Bar-Adon, A. and W. F. Leopold (Eds). 1971. Child language: a book of readings, 91-95. Englewood Cliffs, New Jersey: Prentice-Hall.

GRUBER, Jeffrey S. 1967. Topicalization in child language. In: Bar-Adon, A. and W. F. Leopold (Eds). 1971. Child language: a book of readings, 364-382. Englewood Cliffs, New Jersey: Prentice-Hall.

HASS, Wilbur A. and Sarah K. Hass. 1972. Syntactic structure and language development in retardates. In: Schiefelbusch, Richard L. (Ed). Language of the mentally retarded, 35-51. Baltimore: University Park Press.

HOCKETT, Charles F. 1967. Where the tongue slips, there slip I. In: To honor Roman Jakobson, 910-936. The Hague: Mouton.

HSIEH, Hsin-I. 1972. On listing phonological surface forms in the lexicon. University of Hawaii: Mimeo.

HYMES, Dell. 1972. On personal pronouns: "fourth" person and phones thematic aspects. In: Smith, Estelle M (Ed). Studies in linguistics in honor of George L. Trager, 100-121. The Hague: Mouton.

JAKOBSON, Roman. 1968. Child language, aphasia, and phonological universals. The Hague: Mouton.

KAPLAN, Eleanor and George Kaplan. 1971. The prelinguistic child. In: Eliot, John (Ed). Human development and cognitive processes, 358-381. New York: Holt, Rinehart and Winston, Inc.

KIPARSKY, P. 1968a. Linguistic universals and linguistic change. In: Bach, Emmon and Robert T. Harms (Eds). Universals in linguistic theory, 170-202. New York: Holt, Rinehart and Winston, Inc.

__________. 1968b. How abstract is phonology? Bloomington: Indiana University Linguistic Club. Mimeo.

__________. 1971. Historical linguistics. In: Dingwall, Wm. Orr. (Ed). Survey of linguistic science, 577-649. College Park, Maryland: University of Maryland Linguistics Program.

LABOV, William. 1970. The study of language in its social context. Studium Generale 23.30-87.

__________. 1971. Methodology. In: Dingwall, Wm. Orr. (Ed). Survey of linguistic science, 412-497. College Park, Maryland. University of Maryland Linguistics Program.

LENNEBERG, E. H. 1967. Biological foundations of language. New York: John Wiley and Sons, Inc.

LEOPOLD, Werner F. 1953. Patterning in children's language learning. In: Bar-Adon, A. and W. F. Leopold (Eds). 1971. Child language: a book of readings, 134-141. Englewood Cliffs, New Jersey: Prentice-Hall.

LEWIS, M. M. 1937. The beginning of reference to past and future in a child's speech. In: Bar-Adon, A. and W. F. Leopold (Eds). 1971. Child language: a book of readings, 64-74. Englewood Cliffs, New Jersey: Prentice-Hall.

LIEBERMAN, Philip. 1967. Intonation, perception and language. Cambridge, Mass.: MIT Press.

MALINOWSKI, B. 1937. The dilemma of contemporary linguistics. In: Hymes, Dell (Ed). 1964. Language in culture and society: a reader in linguistics and anthropology, 63-65. New York: Harper and Row.

MCNEILL, David. 1966. Developmental psycholinguistics. In: Smith, Frank and George A. Miller. The genesis of language: a psycholinguistic approach, 15-84. Cambridge, Mass.: MIT Press.

__________. 1970. The acquisition of language. New York: Harper and Row.

MEGGYES, Klára. 1972. The synchrony of different developmental stages. In: Ohnesorg, Karel (Ed). Colloquium paedolinguisticum: proceedings of the first international symposium of paedolinguistics, 159-165. The Hague: Mouton.

MENYUK, Paula and Nancy Bernholz. 1969 Prosodic features and children's language productions. Quarterly progress report, No. 93, 216-219. MIT Research laboratory of electronics. Cambridge, Mass.

MIKEŠ, M., L. Dezso, and P. Vlahovic. 1972. Sentence programming span in child language. In: Ohnesorg, Karel (Ed). Colloquium paedolinguisticum: proceedings of the first international symposium of paedolinguistics, 160-178. The Hague: Mouton.

MILLER, W. R. and S. M. Ervin. 1964. The development of grammar in child language. In: Bar-Adon, A and W. F. Leopold (Eds). 1971. Child language: a book of readings, 321-339. Englewood Cliffs, New Jersey: Prentice-Hall.

ODO, Carol. 1973. Focusing and defocusing in Hawaiian English. In: Bailey, Charles James N. and Roger W. Shuy (Eds). New ways of analysing variation in English, 297-305. Washington, D. C: Georgetown University Press.

OLMSTED, D. L. 1971. Out of the mouth of babes: earliest stages in language learning. The Hague: Mouton.

PAINTER, Colin. 1971. Archetypal breath group and the motor theory of speech perception: evidence from a register tone language. Anthropological linguistics, 13.7. 349-360.

PIAGET, Jean. 1951. Play, dreams and imitation in childhood. New York: Norton.

__________, 1969. The child's conception of the world. Totowa, New Jersey: Littlefield, Adams and Co.

POSTAL, Paul. 1968. Aspects of phonological theory. New York: Harper and Row.

PRUCHA, Jan. 1972. Psycholinguistic study of language acquisition. In: Ohnesorg, Karel (Ed). Colloquium paedolinguisticum: proceedings of the first international symposium of paedolinguistics, 208-220. The Hague: Mouton.

RUDER, Kenneth F. 1972. A psycholinguistic viewpoint of the language acquisition process. In: Schiefelbusch, Richard L. (Ed). Language of the mentally retarded, 3-18. Baltimore: University Park Press.

SARLES, Harvey B. 1972. Critical naturalism and the new linguistics: back to phonology. In: Smith, Estelle M. (Ed). Studies in linguistics in honor of George L. Trager, 66-73. The Hague: Mouton.

SCHERZER, Joel and Regna Darnell. 1972. Outline guide for the ethnographic study of speech use. In: Hymes, Dell and John Gumperz (Ed). Directions in sociolinguistics, 548-554. New York: Holt, Rinehart and Winston, Inc.

SMITH, Nielson V. 1973. The acquisition of phonology: a case study. Cambridge, England: Cambridge University Press.

STAMPE, David. 1969. The acquisition of phonetic representation. Papers from the fifth regional meeting of the Chicago linguistic society, Binnick, Robert I. (Ed). 443-453. Chicago: Department of Linguistics, University of Chicago.

VANDERSLICE, Ralph and Laura Shun Pierson. 1967. Prosodic features of Hawaiian English. The quarterly journal of speech. LIII, No. 2. 156-166.

VELTEN, H. V. 1943. The growth of phonemic and lexical patterns in infant language. In: Bar-Adon, A. and W. F. Leopold (Eds). 1971. Child language: a book of readings, 82-91. Englewood Cliffs, New Jersey: Prentice-Hall.

VETTER, Harold J. and Richard W. Howell. 1971. Theories of language acquisition. Journal of psycholinguistic research, Vol. 1, No. 1. 31-64.

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